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Suggested abbreviation: J. Space L.

JOURNAL OF SPACE LAW

A journal devoted to the legal problems arising
out of man's activities in outer space

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ANNOUNCEMENT

This combined issue (Nos. 1 and 2, 1981) of the Journal of Space Law carries contributions submitted by eminent authorities in connection with the symposium on "Space Law in Perspective" which was held on April 21, 1980 at the University of Mississippi Law Center under the chairmanship of Professor Stephen Gorove. The presentations deal with vital issues of space law within the broader framework of policy and trend perspectives, both domestic and international.

This issue also includes the names of two new members of the Editorial Board and Advisors of the Journal. They are Messrs. Michel G. Bourély and Nandasiri Jasentuliyana. Mr. Bourély received his Doctor of Laws degree from the University of Paris and served subsequently in the Ministry of Justice in Paris. In 1962 he joined the staff of ELDO as legal adviser in charge of external relations and in 1972 he was appointed to ESRO (now ESA) as Legal Adviser, Head of the Legal and Intellectual Property Department. He is a member of the Board of Directors of the International Institute of Space Law and the author of a book on the European Space Conference and of several articles in English and French legal periodicals. Mr. Jasentuliyana received his undergraduate law degrees in Ceylon and London and his LL.M. at McGill University. He has been working in the United Nations since 1965 where he has served as Secretary or Deputy of the United Nations Committee on the Peaceful Uses of Outer Space and its Scientific and Legal Sub-Committees as well as of the Working Group on Navigation Satellites and the Working Group on Direct Broadcast Satellites. He has represented the United Nations at several international meetings, including the INMARSAT, INTELSAT and ITU conferences, the International Astronautical Federation (IAF), Committee on Space Research (COSPAR) and other United Nations meetings. He is presently the Chief, Committee Services and Reports and Research Section of the U.N. Outer Space Affairs Division. Mr. Jasentuliyana has lectured at Princeton, Stanford, Columbia, Boston and McGill Universities and has authored several articles on space-related subjects as well as a Manual on Space Law published by Oceana and Sijthoff. The JOURNAL takes great pleasure in welcoming these two distinguished authorities to its Editorial Board.

SOME REFLECTIONS ON THE STATE OF THE LAW OF OUTER SPACE

Manfred Lachs *

Background

It may be timely to compare this new chapter of law opened due to the development of science and technology with others which were born as the result of similar activities of men penetrating into new dimensions. New types of activity were carried out in dimensions where man has lived for centuries and has established its institutions, such as railways, carriages and cars. There has been another chapter where man began activities in areas which he had not penetrated before. These were steamships and airplanes. The steamship concerned water, which was known to man in rivers and lakes. For centuries air has also been accessible to man, because he has been breathing it and has been in contact with it as a hunter, climber or simply sportsman. There was only one dimension in air which was unknown to man; that was the height and the consequences of movement above inhabited territories, and the dangers of doing so.

Outer space was a completely new proposition because all dimensions were new: space itself, planets, stars, galaxies; all this was known only through observations and magnifying glasses; therefore, man was operating on the basis of a certain speculation and anticipation of events. There was no certainty; there were merely hypotheses. In fact there were the many old dreams. You know most of them - Lucien Somasata whose hero found himself on the moon by accident and where he found inhabitants called Hippogippi. The strangest among them was perhaps that of Francis Goodwin, the Bishop of Hereford, living around the 16th century, who reported a journey in a device drawn by 25 geese to the moon and who called his story *The Man on the Moon:* it was Domingo Gonzales who landed in 1599 on the moon. Particular effort was made to convince the readers that he really was on the moon.

Today it is suggested that the name Domingo Gonzales was a pseudonym for Francis Goodwin. *The Man on the Moon* appeared five years after the death of Goodwin and was entered into the catalogue as being written in Spanish by Domingo Gonzales and translated into English by Edward Mahen. But enough of legends!

New chapters of law were born as the result of man's penetrating either into uninhabited areas like the Arctic and Antarctic, the sea or the air. Once the first flying objects appeared above land and states saw the need to establish rules concerning aerial navigation, the law of the air was born, expressed in the Paris Convention of 1919 and in Chicago in 1944.

The start of the work on the law of outer space was taken very early, and fortunately so. Soon 22 years will have passed since the first Sputnik was sent into orbit and relayed information from outer space. On the 12th of April, 19 years will have passed since Yuri Gagarin embarked upon a journey around the earth and entered into orbit in his space vehicle; and only 11 years ago, on July 21, 1969, Neil Armstrong put his foot on the

*Judge, International Court of Justice, The Hague.

moon having descended on the Sea of Tranquility. His landing was followed by further landings on the earth satellite in the same year, in 1971 and in 1972. To some of these great events the simple, modest, but significant words of Neil Armstrong apply: "That is one small step for man, one giant leap for mankind."

General Observation

Two decades have passed since man entered into space and began a new venture. The two decades may be divided into two parts; in the first ten years satellites were sent into orbit around the earth to obtain scientific information and instruments were sent in the direction of the moon, Mars and Venus. During those years guidance accuracy improved; communication with spacecraft became more precise; the capability of man to operate in zero gravity was demonstrated; and the use of space for communication, navigation and meteorological satellites was considerably enlarged. Further transmission of information by sound and picture made serious progress; the Van Allen radiation belt was discovered. On the other hand, the nature and character of solar winds and storms were ascertained.

The first decade was concluded also by man's landing on the moon and undertaking long journeys around the earth. The landing on the moon was in itself a very great success; for we have to realize that it constitutes 27.5% diameter of the earth - thus a satellite one quarter as big as the planet earth itself. Since there is no atmosphere on the moon, it offered an excellent area for astronomic observation; in particular its very vacuum constituted an environment in which materials could be manufactured for scientific purposes. There were even scientists who visualized the possibility of certain tests being conducted with a cell. In other words, if the moon's crust were analyzed and represented an organic substance at a certain stage part way to life or sub-life, then it would contain the most primitive cells known on earth. Thus it should have been possible to determine what goes wrong in a counter cell.

The aforementioned hopes did not materialize. Most of the discoveries proved that the moon was covered by crystalline rock with volcanic activity; that layers of iron and titanium may have been found at the bottom of the ancient lava pools, but it was not ascertained how the moon came into being; as a result scientists have remained in doubt. Two theories which have been fighting each other are: (1) the moon was a fragment of the earth, and (2) the moon was formed outside of the earth and was captured by its gravity.

In these circumstances, no final conclusion could be made. Thus it has been argued by certain scientists that the experiments conducted on the moon were much more an engineering than a scientific triumph.

There were other achievements of the astronauts, namely the pictures made by them of the earth's surface. These pictures have produced invaluable information concerning the subsoil and the raw materials which are hidden by the surface of the earth.

Altogether the first decade of space exploration has given man the opportunity to use space for all sorts of experiments, in particular, as one of the scientists put it, following the pattern of Fleming's culture plate on which penicillin was born or Pasteur's sour milk. Scientists could then proceed further to the exploration and penetration of space and the universe.

While the discoveries made on the moon have not satisfied human curiosity and we have not really obtained what we expected, the adventure has gone on. We have moved further; discoveries concerning Venus and Jupiter may be worth mentioning. What was found, in fact, was a new solar system: moons, each with the surface the size of Africa with some volcanoes on them and, as an American scientist, Dr. Lawrence Soderblon said, "We have seen the oldest, the brightest, the darkest, the reddest and the most active bodies in the solar system." From the first day and throughout we have faced the great question: what will be the further practical consequences of these discoveries?

Many ideas guided those who were embarking upon these adventures. Scientists, technicians, those heroes, "the envoys of mankind" - we call them - who ventured into space without knowing whether they would ever return to earth. It is not the purpose of this writer to go into the many objectives which were in the minds of those concerned, but certainly two were very important. One was to penetrate as far as possible into this immense sphere outside our small globe to discover what is in it; to penetrate the secret links between life here - events and facts over there, and secondly, to see how these journeys into outer space could help and develop life on our planet. [So within 22 years about 10,650 satellites or bits of debris were tracked in space; about 4,500 or more are still there.] The urge to do it was stronger than the many warnings uttered at the time, and one of them was very peculiar—one may recall the words of Bertrand Russell.:

> "A Minister for Foreign Affairs will go to the moon, will be conscious of his public obligation, honestly and nobly carried out, and will retain without shame his stupid views with which he commenced the journey."

In other words, Russell, like others, claimed that the journey into outer space would not make us wiser. Yet it was inevitable. It was, as stated earlier, man's urge to penetrate the Universe and to discover the secrets of life - that urge as old as history recorded by the ancients in the writings of Heraclitus and Democritus, or Polibius. One may recall the early ideas about the Universe by the poet Lucretius, who in his *De Rerum Natura* spoke of infinite atoms in eternal motion, of evolving and disintegrating earths and suns, of man's thoughts, penetrating all barriers. A few thousand years later, Jacques Monod returned to this idea and spoke of life in his *Hasard et Necessite*:

> "In the last few years we have come to understand life and to reach the conclusion that it has no architect; it is a product of a gigantic lottery which throws numbers out at random."

Could one therefore draw the conclusion that we have made a full circle? It is doubtful that this would be right. The journey has to continue.

Voyager I and II on their way to Jupiter took with them copper plates with recorded sounds of the earth like Beethoven's Violin Concerto, and greetings in 55 languages for other civilizations, if they exist, to hear. Frank Drake, the physicist, continues with the search for signals from other planets from a special installation, a bowl-shaped antennae suspended in the hills of Puerto Rico in Aricibo with a radio-telescope as large as a football field, waiting for voices from space. Fred Hoyle, the great astronomer, continues to claim that life began outside our globe. Earlier Kant thought that Jupiter had inhabitants, and the great mathematician Gauss thought the same of Mars. But we remain suspended in doubt as to the probability of life existing elsewhere.

Some scientists are now beginning to take a different approach, claiming that, in order to establish the existence of life or civilizations elsewhere, we have to change man's approach, based on the search for a civilization similar to ours while those "over there" may be entirely different and therefore different criteria must be applied in order to make progress in the cognitive process.

Yet, however we may view it, the venture into space should be seen as one of the three great revolutions man has gone through in this age. The other two were the splitting of the atom and the breaking of the genetic codes. Each was a milestone in the history of man. Small wonder that it has been said that scientists "come to be regarded almost as magicians, feared rather than admired". Thus the venture into space is not an isolated phenomenon. It is part of a concentrated effort of man's search and continuous attempt to master nature, to control it, to use and change it for his own purpose.

Turning to another element involved in this process, there is a new unity reflected in the relationship between science and technology.

This relationship has rightly been described as follows: "Science has fed reliable information to technology, and technology has reciprocated by providing science with ingenious precision instruments. The new instruments have extended the range of the human senses and provided a speed of reaction and accuracy beyond human limitations."[1] Thus technology is following in the footsteps of science at a tremendous speed. The consequence of it is that science is directly intervening in events; technology is becoming an economic, social and political factor in the life of nations and in the life of the international community. This global process of technological development has several characteristic features. One important, even decisive, element is that each of the inventions, each of the great achievements of our generation and each of the three revolutions we have gone through can be used for the good or evil of man, for its progress or its destruction.

Here is a domain in which it is essential for law to intervene; it must enter it in a dual capacity. First there is its regulatory force concerning the objective of a certain invention, its use and practical application and secondly, its use as an instrument of control of what has been described as the by-product of many inventions. For apart from the objective to which an invention is directed which may be constructive and salutary to man, it may bring about by-products of so harmful a character that it may finally vitiate the very purpose of the invention itself. It may overshadow whatever good has been done by the invention in the particular field. In fact, this has been the function of law from the very outset.

One may raise the question, why the term "outer space"? While the venture was a great achievement, there is something presumptious in it. Why did we call it "outer space"? Space is "outer" in relation to the small planet called earth. In fact, it is the universe - minus our globe, or perhaps minus a small, narrow band of the air space surrounding it. Thus in building a law for the universe minus our globe we are relying on an anthropocentric approach. In all domains and so in law-making this anthropocentrism is the result of our special capacities so well described by a great scientist:

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[1]R. Calder, Man and Cosmos 5 (1968).

> Amongst the multitude of animals which scamper, fly, burrow and swim around us, man is the only one who is not locked into his environment. His imagination, his reason, his emotional subtlety and his thoroughness made it possible for him not to accept the environment but to change it.[2]

Faced with the tremendous dimension which is the universe, man has tried to establish the first rules of conduct in regard to it and within it. This leads to the main purpose of the general observations on the subject: reflections on the balance sheet of the two decades.

First, it may be true that once the first satellite was launched into outer space, man thought that the links between space and our globe would become much more regular; that a quicker and more permanent communication would be established between what is now considered outer space and inner space. In this respect, we may have been disappointed. Second, events in outer space have not had the impact we expected on what is happening on earth - to be more correct, less in what we expected, and more in what we did not expect. The worlds in inner and outer space have remained separated; only a few men have undertaken the journey to the stars; the progress in this respect has been much slower than that of aerial navigation.

The two worlds also remain separated in other spheres: it is science and perhaps technology which are the main beneficiaries of the venture - and only on a long term basis. Moreover, a fascinating phenomenon has begun to dominate the scene. While we penetrate other planets and try to discover the secrets of remote worlds, among the greatest achievements we have to count the discovery, through this roundabout way and from such a distance, of the hidden treasures of our globe and the atmosphere surrounding it. It is here where developments have concentrated on issues other than those we expected. Through outer space we turn deeper into our earth. A similar phenomenon may affect law: through some new concepts applied to outer space we improve—this author would say more—we revolutionize the law here on earth.

Thus those journeys have consequences affecting our lives - not because we know more of the universe but because through it as a medium, our life, in various dimensions, progresses and becomes richer. Few could have expected these surprising results; it is as if a remote perspective was needed to familiarize ourselves with the depth of our globe, to improve the rules of law with great achievements of modern technology.

Some Key Issues

Before going into greater detail in these conclusions, a look at the beginnings is necessary. We first embarked upon this work 20 years ago; it was then that the first *ad hoc* committee met from May 6, 1959 to June 25, 1959. Three key issues faced the law makers in this respect. First was the question of entry into outer space; second the status of it; and third the activities within outer space.

The rules concerning the way into space belonged to that part of the law which has been shaped by practice, *via facti* without any special written agreement. States which began launching space objects announced the fact but did not request permission of overflight from those States the territories of which they overflew. What is more the States directly concerned did not protest; they made no reservations. This practice,

[2] J. Bronowski, The Ascent of Man 19 (1973).

established from the very outset, continues and entry into space has become a generally recognized principle open to all States that can benefit from such flights. Thus potentially every State, the Maldive Islands and the United States, the Congo and the Soviet Union has the right to enter outer space. In view of this practice having been established for some years, can we speak already of the existence of what may be called the "right of innocent passage"?

The time factor is today much more limited than in the past. This view has been expressed by this writer in a different context:

> With regard to the time factor, the formation of law by State practice has in the past frequently been associated with the passage of a long period of time. There is no doubt that in some cases this may be justified. However, the great acceleration of social and economic change, combined with that of science and technology, have confronted law with a serious challenge: one it must meet, lest it lag even farther behind events than it has been wont to do.[3]

The International Court of Justice made it clear that the passage of a short period of time in itself cannot be an obstacle in the formation of a customary rule of law.[4]

As to overflights, no protest was launched at a time when the scope of outer space was not yet clearly defined. This practice has continued from the day when outer space was declared "free for exploration and use to all States." In the circumstances, as this writer stated, "The law relating to access to outer space must facilitate and not frustrate the endeavours of any State to avail itself for lawful purposes of the rights flowing from it."[5]

The question which remains open and which has not been regulated yet is: what should be defined as "innocent passage"? Obviously, it is a passage of an object which moves into outer space in order to explore it and use it in a lawful way. Thus the notion of innocent passage is closely linked with the utilization of outer space itself; that is its objective.

For while accepting it, one cannot presume it as having been granted by the States concerned for all types of flights whatever their character and whatever the nature of the object. The overall objective, peaceful use of outer space, international co-operation and all the general principles so clearly established in the first documents, made it clear that the notion of innocent passage could be accepted with the growing acceptance of the limitation of activities of States in the interest of the international community only. Not all writers share this view on the subject.

Turning now to the second key issue faced by the law makers, that is the status of outer space, the principal question concerns the status of that huge void called space and all the objects situated within it. Articles 1 and 2 of the Space Treaty indicate that: "The exploration 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."

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[3]*North Sea Continental Shelf* case, [1969] I.C.J. 230.

[4][1969] I.C.J. 42, para. 73. It stressed that, "Although the passage of only a short period of time is not necessarily, or of itself, a bar to the formation of a new rule of customary international law on the basis of what was originally a purely conventional rule. . . ." *Id.* at 43, para. 74.

[5]M. Lachs, The Law of Outer Space 60 (1972).

Free exploration based on equality is guaranteed by the access to all areas of celestial bodies. A corollary to this is the provision of Article 2 that: "Outer space is not subject to national appropriation by claim of sovereignty by means of use or occupation or by any other means."

Do the words "the province of mankind" define a clear legal status? A similar term was later used in connection with the Ocean Floor and Seabed in the declaration of December 17, 1970. Some writers suggest that the obligations defined in Article 1 and 2 of the Space Treaty are of a purely moral character, that they have no legal consequences. Others, including this writer, think that there is more in it, though further precision on the subject would be desirable. This is confirmed by the recent draft of the Treaty on the Moon accepted on July 3, 1979, by the UN Committee on the Peaceful Uses of Outer Space which does not limit itself to the term "province of mankind" and "the benefit and interest of all countries irrespective of their degree of economic and scientific development," but declares the resources of the moon to be "the common heritage of mankind." This is important progress. The same term is used in the draft elaborated by the Third Conference on the Law of the Sea.[6]

Here we have the first illustration of the impact of an institution intended for outer space only - getting down into other dimensions. This notion is now gaining root in international law and more precision should be given to the terms "province" and "heritage" of mankind. Any possible distinction between them should be made clear. It has been this writer's view from the beginning that the term should not be defined as *rex extra comercium.* It is a question of the object remaining within the disposition of the international community as a whole. Moreover, a distinction could be made between what could be regarded as an object which can be used and an object which cannot be used. For instance, space itself constitutes an area which is used for purposes of travel while a star or planet may contain resources which could be used for one or the other purposes. The concept itself, while now applied in regard to outer space, to the resources of the moon, to the ocean floor and seabed, may expand further; in particular, in the context of a new international economic order certain resources may become the common heritage of mankind in order to make the distribution of wealth more equitable. It is interesting to record that the institution and the term originated in the first treaty for outer space.

For obvious reasons only very few States are able to use and explore outer space. The question of the participation of others in these explorations is a matter for the future. It is therefore, important to give the term "common heritage" such a meaning thatit becomes practical and it does not remain within the sphere of theory. It is therefore worth recalling that:

> Parties to the treaty conducting activities in outer space, including the moon and other celestial bodies agree to inform the Secretary-General of the United Nations as well as the public and the international scientific community to the greatest extent feasible and practical of the nature, conduct, location and results of such activities.[7]

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[6]*Cf.* Art. 136 of the Informal Composite Negotiating Text Doc., A/CONF. 62/WP.10/REV. 1: "The Area and its Resources Are the Common Heritage of Mankind."

[7]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. 11, [1967] 18 U.S.T. 2410, T.I.A.S. 6347, 610 U.N.T.S. 205 (effective Oct. 10, 1967).

This provision has some legal implications though the decision as to what extent it is "feasible and practical" to convey such information remains within the sole decision of the State concerned. Thus further elaboration of the principle is called for.

It is interesting to note that, in view of the immense size of outer space, no thought was given to the problems that may arise in regard to the accumulation of an excessive number of instruments and vehicles. Yet we have now reached the stage where, in some areas, overcrowding occurs: of man-made instruments this is the case of a geostationary orbit where at present about 108 vehicles are concentrated together with a lot of debris. Thus it has become an issue which calls for serious attention.[8]

Conclusion

The following are some problems which deserve some reflection. "In the post-Renaissance era," said Sir Peter Medawar, President of the British Association for the Advancement of Science, in his presidential address of September 3, 1969, "it was taken for granted that the poor old world was superannuated; that history had all but run its course and was soon coming to an end. Today, we are conscious that human history is only just beginning." This statement by one of the great scientists of our day describes the real situation. We are only starting to develop science, as human beings and members of the international community, we are at the beginning of the road. In this respect outer space is one of the big chapters of man's activities which shows its potentialities. Man entered into it driven by an inborn urge for adventure and greater control of nature. Technology gave him the instruments necessary to reach so far out of the era of our normal life and here science has proved what Einstein so rightly defined as, "a phenomenon which pervades all aspects of our life." Once man moved there it was necessary to establish a code of conduct. So far, we have too few rules on the subject and they require further elaboration and adaptation to the needs and goals they are intended to serve. We must expand the realm of law and make it serve the interests of man. The law on the subject must particularly develop in the areas referred to earlier; those which have an impact on events on our globe; the common heritage of mankind; to make the benefits of the use of outer space accessible to all; to prevent abuse and strive towards an equitable progress.

The law which has been established so far is only a scaffolding for the law to come. We have started at the right point in time, and we have established a set of rules, but they have to be supplemented by new provisions. The Law of Outer Space is not only a system of rules concerning activity in a new dimension; the environment to which it is related may also become a model, an illustration to others.

At the very outset when the United Nations Committee for the Peaceful Uses of Outer Space was established, two Subcommittees were brought into being; one legal, and the other scientific and technological. This initiative, aiming at closer cooperation between jurists and scientists is both significant and symbolic. Also in this respect the

[8]It is in this context that mention should be made of the action of a group of the so-called equatorial States: Colombia, Ecuador, Zaire, Uganda, Guatemala and Indonesia; Declaration at Bogota on December 3, 1976, in which they proclaimed claims to segments of the geostationary orbit. For a text of the English translation of the Bogota Declaration, *see* ITU, Broadcasting Satellite Conference, Doc. No. 81-E at Annex 4 (January 17, 1977), reprinted in 6 J. Space L. 193 (1978).

lawmaker has made a new and most useful approach; he has given an example to be followed by others. For progress in either field, in the interest of both, requires the cooperation of both.

THE ADVANCES IN INTERNATIONAL LAW THROUGH THE LAW OF OUTER SPACE

*Aldo Armando Cocca**

Undoubtedly, Space Law is the most advanced legal science. It would be incorrect to say that it is the most sophisticated branch of international law as this would amount to ignoring the origin and perspective of the Law of Outer Space.

The concept of Space Law is related to a humanistic philosophy wich began gaining ground until it reached the feeling of peoples and the consensus of lawyers, even before any international agreement was adopted. Its realm goes beyond inter-statal relationships. It considers the welfare of man as the beginning and the end of all human activity, even though a so-called "humanized" technique may be used and notwithstanding the fact that the improvements in machines—including surprisingly refined robots—are trying to outspace the person as main objective of all space activities. The distance of those areas already reached cannot—within the cosmic dimension—reflect the intention of not considering men as the holders of fundamental and non-transferable human rights.

The fact that Space Law is elaborated within the United Nations confirms the above statement. The cycle followed by men—by human beings—as subjects of Law is as follows: MAN-SOCIETY-STATE-INTERNATIONAL COMMUNITY-MANKIND. The United Nations is a forum where the international community expresses its views. Only such community, as a whole, may indicate the principles and determine the rules to govern this law of a universal scope.

Space is the culmination of the concept MAN-SOCIETY. It is a reflection of the present stage and perhaps the definitive one in the development of man within the community. For this reason Space Law is able to determine advances and progress, which amounts to the perfecting of International Law. However, the reverse is not true.

It is understood that in the present paper the term "advance" is used in the sense of improvement. Growth or development may turn out to be defective. It may only be seen as an "advance" when it implies an improvement.

Progress in the field of Space Law is of no small importance and mostly comes under the category *de lege ferenda.* With regard to International Law, and within the field *de lege lata,* the following may be mentioned:

1. Jus Humanitatis

Jus Humanitatis is the Law of, and for, Mankind. Man is its natural holder within the social complex. It is not International Law—which governs international relations—even if Man were considered as a subject of International Law. Neither is it the international community—the third political dimension of Man—but it is the human race as a whole, that is to say, the fourth political dimension of Man.

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This has led many writers to consider Mankind as a legal subject and even state that such a characteristic arises from Law after the entry into force of the Outer Space Treaty.[1]

The Outer Space Treaty repeatedly refers to "mankind," "peoples," instead of "international community", "States", "nations". In the Preamble it is said: "Inspired in the great prospects opening up before *Mankind*. . .", "Recognizing the common interest of all *Mankind*. . ." (italics of the author). In these cases the word "Mankind" appears strengthened by the term "all" and "interest" by the word "common". Thus the intention of the drafters of the Treaty could not have been more explicit.

The Preamble equally states: "Believing that the exploration and use of Outer Space should be carried out for the *benefit of all peoples* irrespective of the degree of their economic or scientific development. . ." (italics of the author). Therefore, "peoples" is strengthened by "all".

Article I provides that "The exploration and use of outer space, including the Moon and other celestial bodies, . . . shall be the *province of all mankind*" (italics of the author).

Because of its nature as universal Law, the Treaty "shall be open to all States" (article XIV). Article V provides that "States Parties to the Treaty shall regard astronauts as *envoys of mankind* in outer space. . ." (italics of the author).

The reference to "prospects", "common interest", "benefits", "the province" are indicating the existence of a legal subject which is not the State, but rather *mankind* or, to be more precise, *HUMANKIND.*

2. Res Communis Humanitatis

International Law has taken the idea of *res communis* from Roman Law and applied it to the different areas in Earth. From the moment that outer space and celestial bodies are subject to a *jus humanitatis,* it is proper to speak of a *res communis humanitatis.* The latin term "humanitatis" is ambivalent and, as already stated, means of and for. We are therefore referring to things—in the legal sense—belonging to and for Humankind.

All the references made in the last paragraph are fully applicable to this concept. It is, however, necessary to add an important provision contained in the Outer Space Treaty (article II): "Outer Space, including the moon and other celestial bodies, *is not subject to national appropriation by claims of sovereignty, by means of use or occupation, or by any other means*" (italics of the author). Thus, if no national occupation on the part of States is possible, it is something common to all Humankind, considered as a whole.

3. The Common Heritage of Mankind

This expression was used for the first time at the United Nations by the present writer in 1967:

[1]Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and other Celestial Bodies (hereinafter the "Outer Space Treaty"), Jan. 27, 1967, [1967] 18 U.S.T. 2410, T.I.A.S. 610 (effective Oct. 10, 1967).

> Indeed, the paternity of the 'common heritage' concept is, more often than not, attributed to the Permanent Mission of Malta to the U.N. in a Note Verbale of 17 August 1967 (recorded in Doc. A/6695 of 18 August 1967). Yet it is not quite exact. If one looks at the Archives of Publications in the Library of the Palais des Nations at Geneva, it is easy to realize that it was in the U.N. Committee on Outer Space, and not in the Seabed Committee, that the expression 'common heritage' was first used and explained. In this connection resort has been made to Doc. A/AC.105/C.2/SR 75 (Spanish, English and French texts) corresponding to the inaugural session of that year, 19 June 1967, at 3:15 p.m.[2]

Because it was believed that the concept in question would finally be accepted by the international community, we later proposed—in May 1970—the "Draft Agreement on the principles governing the activities of States in the use of the natural resources of the moon and other celestial bodies."[3] Article 1 of this Draft Agreement provides that "The natural resources of the Moon and other Celestial Bodies shall be *the common heritage of ALL MANKIND*" (italics of the author). This is the first international text where the principle appeared. It was later examined in the Seabed Committee and towards the end of 1970 a U.N.G.A. Resolution was adopted—although not a binding agreement—where reference was made to the concept of common heritage which was born in 1954 during the Vth Congress of the International Astronautical Federation, Innsbruck, and applied to the law of outer space. The International Law of the Sea has so far not agreed upon any international text including the principle. It is worthy of mention that, after 26 years of holding priority both in doctrine and as an actual proposal at the U.N. Outer Space Committee (UNCOPUOS) some 13 years ago, the principle of the common heritage of mankind was embodied in the Agreement Governing the Activities of States on the Moon and other Celestial Bodies.[4]

Article XI of this Agreement establishes that "The Moon and its natural resources are *the common heritage of mankind,* which finds its expression in the provisions of this Agreement and in particular in paragraph 5 of this article" (italics of the author).

The above-mentioned paragraph 5 states that "States Parties to this Agreement hereby undertake to establish an international regime, including appropriate procedures, to govern the exploitation of the natural resources of the moon as such exploitation is about to become feasible. This provision shall be implemented in accordance with article XVIII of this Agreement". Article XVIII provides that: . . . A review conference shall also consider the question of the implementation of the provisions of Article XI, paragraph 5, on the basis of *the principle* referred to in paragraph 1 of that article and taking into account in particular any relevant technological developments" (italics of the author).

It is essential to point out that the Agreement, in the above-mentioned article *in fine,* determines the nature of the common heritage concept as a legal principle. The discussion went on for nine years at the U.N. to determine whether it was merely a

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[2]Williams, "The Role of Equity in the Law of Outer Space," 5 Int'l. Rel. 1 (1975).

[3]U.N. Doc. A/AC.105/C.2/L.71 and Corr. 1 (1970). Also, *inter alia,* U.N. Doc. A/AC.105/85, July 3, 1970, Annex II, at 1.

[4]Agreement Governing the Activities of States on the Moon and Other Celestial Bodies, (hereinafter "Moon Agreement"), U.N. GAOR, 34th Sess., Suppl. No. 20, Doc. A/34/20 (1979). See also U.N.G.A. Res. 34/68 (Dec. 14, 1979).

concept—a thesis supported by those who did not agree on the inclusion thereof in the text—or a legal principle, which was the firm position of the author of the first draft and also of all who shared his opinion.

It is not possible within this brief analysis to go into the question of the extraordinary importance that the solemn and unanimous adoption of this legal principle by the international community on 14 December 1979, at the U.N. General Assembly has meant for the development of Space Law and, consequently, of International Law. Yet, reference ought to be made to the Working Paper submitted by Argentina on 17 April 1973 at the Legal Sub-Committee of U.N. COPUOS[5]. Without any claim to exhaust other inherent points of substance, the following may be stated:

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

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

With respect to the international regime—twice mentioned in the document in question—reference may be made to my opinion given to my distinguished friend, Mrs. Eilene Galloway in a letter of 31 January 1980 which is quoted with her permission.

> It is rather dangerous to crystallize in a definition the principle involved in a concept which is being just born in a new domain of Space Law, such as "the common heritage of mankind", as it was established in the Moon Agreement. As for the "international regime" concerned, I dare say it is not a matter of definition; I feel it must be the outcome of the implementation of the guidelines set forth in the agreement.[6]

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[5]U.N. Doc. A/AC.105/115, Annex I, at 29-30-31 (1973).

[6]The Council of Advanced International Studies, Ambassador Cocca's correspondence, No. 384 (Jan. 1980).

Finally, in my view, it is preferable to speak of the *common heritage of mankind,* so as to give a more spiritual connotation to the newly adopted legal principle.

4. Representation of Mankind in Outer Space and Celestial Bodies

The importance of the provision in article V of the Outer Space Treaty: "States Parties to the Treaty shall regard astronauts as envoys of mankind. . ." lies in the fact that astronauts have been invested with the legal representation of mankind in outer space and celestial bodies. No other former representation has ever been as wide, and—politically—it goes beyond the most audacious ambition. On the other hand, it should be borne in mind that it has been conferred by the international community as a whole, in a public assembly, by unanimity and acclamation. Also, there is no precedent on any similar means of conferring a mandate.

5. Exploration and Use for the Benefit and Interest of all Peoples

The Preamble to the Outer Space Treaty speaks of "the benefit of all peoples irrespective of the degree of their economic or scientific development". Article I confirms the Preamble: "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*" (italics of the author). It should be recalled that the Declaration of Legal Principles which preceded the Treaty required that all activities of exploration and use shall be carried out for the benefit and in the interest of all mankind.[7]

The use of the verb "shall be" is of great importance in both cases. And all of us who have some time taken part in the elaboration of this Treaty certainly are aware of the difficulties of reaching consensus on the tense used within the text.

6. International Cooperation as a Requisite for the Lawfulness of Activities of Exploration and Use

The term "international cooperation" appears several times throughout the text of the Outer Space Treaty. The tense of the verb clearly indicates that it amounts to something more than an aspiration: it is an obligation undertaken by States Parties to the Treaty. Article I, paragraph 3, with regard to scientific investigation establishes that "States *shall facilitate and encourage* cooperation in such investigation" (italics of the author). Article III provides that States Parties "shall carry on. . . [activities] promoting international cooperation and understanding". Article X states: "In order to promote international cooperation in the exploration and use of outer space. . . the States Parties to the Treaty shall consider. . .". Similarly, article XI provides: "In order to promote international cooperation in the peaceful exploration and use of outer space. . . States Parties agree. . .". Article XII states that, "All stations, installations, equipment and space vehicles on the moon and other celestial bodies shall be open. . .".

[7]U.N.G.A. Res. 1962/XVIII (Dec. 13, 1963).

From the foregoing observations one may fairly conclude that the participants in the CNIE-UNESCO Seminar on "The teaching of International Law as applied to outer space and space communications" (Buenos Aires, August 1972) were certainly right in declaring that international cooperation was a legal obligation arising from the Outer Space Treaty, an obligation which conditioned the lawfulness of space activities.[8]

7. Freedom of Exploration and Use of Outer Space and Celestial Bodies and Banning of National Appropriation

When the exploration and use of outer space is carried out for the benefit and in the interest of Humankind and international cooperation is a necessary assumption for outer space activities—which may never be carried out for the benefit of one State or group of States but only, for the general benefit of mankind—it obviously follows that outer space and celestial bodies are open for exploration and use. Hence the reading of article I: "Outer Space, including the moon and other celestial bodies, shall be free for exploration and use by all States without discrimination of any kind, on a basis of equality and in accordance with international law, and there shall be free access to all areas of celestial bodies" and "There shall be freedom of scientific investigation. . ."

The recognition of these rights to States entails certain obligations: every State is bound to respect the rights and interests of other states, which amounts to speaking of the rights and interests of mankind which is acting through the State.

The principle of non-appropriation, established in article II of the Outer Space Treaty, is a necessary complement to the principle of freedom: "Outer space, including the moon and other celestial bodies, is not subject to national appropriation by claim of sovereignty, by means of use or occupation, or by any other means". This principle was first enunciated in Resolution 1721 (XVI) of the U.N. General Assembly[9] and was later included in the Declaration of Legal Principles contained in Resolution 1962.

8. The Predetermined Legal Framework

Article I, paragraph 2 and article III of the Outer Space Treaty establish the application of international law and the U.N. Charter to all outer space activities. Henceforth and so far, the determination of a precise legal framework has remained the goal of the drafters of these treaties. If we look at the recently adopted Agreement Governing the Activities of States on the Moon and other Celestial Bodies, it may be seen that it includes the traditional mention of International Law and the U.N. Charter, later adding: "and taking into account the Declaration on Principles of International Law concerning Friendly Relations and Cooperation among States in accordance with the Charter of the United Nations" (October 24, 1970). Most significant is a specific reference to the law of outer space contained in the Preamble to the said Agreement where the four preceding Conventions are also referred to.

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[8]La Ensenanza del Derecho Internacional aplicado al espacio y a las communicaciones espaciales, CNIE-UNESCO Seminar, Buenos Aires, August 1972, at 81.

[9]U.N.G.A. Res. 1971/XVI (Dec. 20, 1961).

9. Demilitarization

A complete demilitarization is established for the Moon and other Celestial Bodies, according to the second paragraph of article IV of the Outer Space Treaty. There is a regime of partial demilitarization for 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 (article IV, first paragraph).

Article III of the Moon Agreement provides that "Any threat or use of force or any other hostile act in the moon is prohibited. It is likewise prohibited to use the moon in order to commit any such act or to engage in any such threat in relation to the Earth, the Moon, spacecraft, the personnel of spacecraft or man-made space objects" (paragraph 2). "States Parties shall not place in orbit around or other trajectory to or around the moon objects carrying nuclear weapons or any kinds of weapons of mass destruction or place or use such weapons on or in the moon" (paragraph 3). "The establishment of military bases, installations and fortifications, the testing of any type of weapons and the conduct of military manoeuvres on the moon shall be forbidden" (paragraph 4).

10. International Responsibility and Full Compensation

International responsibility, that is, the liability of States and international intergovernmental organizations, is an important step in the pursuance of a better legal balance among the rights and obligations normally recognized among States. In the field of Space Law, the State is the first responsible.

The principle of State liability appears in the 1962 U.N.G.A. Declaration (XVIII). It is embodied in article VI of the Outer Space Treaty as follows: "States Parties to the Treaty shall bear international responsibility for national activities in outer space, including the moon and other celestial bodies, whether such activities are carried on by governmental agencies or by non-governmental entities. . ." When activities are carried on by an international intergovernmental organization, the "responsibility for compliance with this Treaty shall be borne both by the international organization and by the States Parties to the Treaty participating in such organization". Article VII states that "Each State Party to the Treaty that launches or procures the launching of an object into outer space. . . and each State Party from whose territory or facility an object is launched, is internationally liable for damage to another State Party to the Treaty or to its natural or juridical persons . . ."

The Moon Agreement repeats the principle in article XIV, paragraph 1. Paragraph 2 provides that "States Parties to the Treaty recognize that detailed arrangements concerning liability for damage caused on the moon, in addition to the provisions of the Outer Space Treaty and the Convention on International Liability for Damage caused by Space Objects, may become necessary as a result of more extensive activities on the moon. Any such arrangements shall be elaborated in accordance with the procedures provided for in article XVIII of this Agreement".

The principle of "full compensation" appears in the Convention on International Liability for Damage caused by Space Objects.[10] The Preamble recognizes in its fourth

[10]Convention on International Liability for Damage caused by Space Objects, March 29, 1972, [1973] 24 U.S.T. 2389, T.I.A.S. 7762 (effective Oct. 9, 1973).

paragraph "the prompt payment under the terms of this Convention of a *full* and equitable measure of compensation to victims of such damage" (italics of the author). The nucleus of this Convention, however, is the non-limitation of the quantum: "in order to provide such reparation in respect of the damage as will restore the person, natural or juridical, State or international organization on whose behalf the claim is presented to the condition which would have existed if the damage had not occurred" (article XII).

11. The prevention of contamination of outer space and the Earth

It is hardly surprising to speak of contamination and pollution, particularly after the 1972 Stockholm Conference where general consensus existed on the serious damage threatening the health of humanity and life on this planet due to contamination caused by man himself.

Space Law has, in this field, important precedents: in 1965 the Scientific and Technical Sub-Committee raised the problem in a recommendation attached to a report submitted by COPUOS to the XX Session of the General Assembly.

Resolution 2130 (XX) adopted the above-mentioned recommendation concerning the struggle against potentially harmful interference of space activities.[11]

The Outer Space Treaty has freed outer space from radioactive contamination in article IX. A possible contamination by Earth substances in outer space has also been foreseen, as well as the prevention of eventual damage to the Earth environment due to the introduction of extra-terrestrial matter.

Article IX provides that ". . . States Parties to the Treaty shall pursue studies of outer space, including the moon and other celestial bodies, and conduct exploration of them so as to avoid their harmful contamination and also adverse changes in the environment of the Earth resulting from the introduction of extra-terrestrial matter and, where necessary, shall adopt appropriate measures for this purpose". This article also establishes the right and obligation of holding consultations at international level when the activity of a State would cause potentially harmful interference with the activities or experiments of others or its own.

These innovations undoubtedly mean an advance in the field of legal sciences. The law of outer space and celestial bodies has proudly gained a place within the realm of juridical knowledge and, as a precursor in many aspects, holds a legitimate paternity with respect to new disciplines, such as the law of the seabed and ocean floor which, in a first generation, borrowed the concept of the common heritage of mankind from the law of outer space. This principle is now being taken on by international environmental law and international energy law.

[11]U.N.G.A. Res. 2130/XX (Dec. 20, 1965).

PERSPECTIVES OF SPACE LAW

Eilene Galloway *

During the past twenty-three years, a body of space law has come into existence and is now recognized as a specialized branch of international law. The legal guidelines for States to observe in the conduct of their space activities have been formulated to avert conflicts among nations as well as to provide procedures designed to solve or mitigate problems. During this time the law has kept abreast and even ahead of space science and technology as numerous applications developed to improve functions of worldwide benefit to society. A point has now been reached where current forecasts portend even greater advances in uses of the space environment for earth-oriented activities and consequently compels a reexamination of assumptions and policies underlying space law. *Perspective* is defined as "the relationship or proportion of the parts of a whole, regarded from a particular standpoint or point in time." Today is our point in time and the perspective on the past, present and future is my own, resulting from experience with national and international developments since 1957 when the space age began.

The deep roots of space law can be traced for several decades prior to 1957. Many legal articles had been published before that time, largely by authors motivated by their need to define the upper limit of sovereign airspace and make philosophical comparisons with debatable boundaries of territorial seas.[1] Pre-satellite articles were based not merely on hypothetical situations, however, because considerable knowledge had been produced by scientists and engineers who wanted to explore the Universe. Early predictions were even made on the practical benefits likely to revolutionize communications and meteorology. They were simply awaiting advances in the art of rocketry.

Ideas and concepts for the governance of outer space as a fourth environment—added to land, air and sea—had already been generated long before spacecraft were launched into earth orbit. Space law was not only for outer space as a separate and distinct spatial area but also for operations performed there for functional uses on the Earth. Between 1958 and 1963, space law concepts were embodied in United Nations resolutions.[2] They had been nurtured during the International Geophysical Year (IGY) when 67 nations cooperated in scientific experiments from July 1, 1957 to December 31,

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[1] "Space Law: A Symposium," prepared at the request of Senator Lyndon B. Johnson, Chairman, Special Committee on Space and Astronautics; prepared by Eilene Galloway. Senate Special Comm. on Space and Astronautics, 85th Cong. 1st Sess., at 573 (Comm. Print. 1958).

[2] U.N.G.A. Resolutions: 1348/XIII (Dec. 13, 1958); 1378/XIV (Nov. 20, 1959); 1472/XIV (Dec. 12, 1959); 1721/XVI (Dec. 20, 1961); 1802/XVII (Dec. 19, 1962); 1884/XVIII (Oct. 17, 1963); 1962/XVIII (Dec. 13, 1963); 1963/XVIII (Dec. 13, 1963).

1958.[3] In fact, the first U.S.S.R. and United States satellite programs were undertaken as part of the IGY whose planning was dominated by mission-minded scientists and engineers dedicated to international cooperation for peaceful purposes.[4] Political policymakers were able to garner a quick harvest of ideas to incorporate in the first formulation of space law. By October 10, 1967, basic space law concepts were already in force according to the Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, Including the Moon and Other Celestial Bodies.[5] Furthermore, a procedure was set in motion to expand legal coverage in new treaties when technological advances required additional regulation. Now, more than two decades later, the quality of foresight exercised at that time can be evaluated. What future problems were perceived and how were they solved or mitigated by preventive measures?

This question can be answered by examining the major positive features of the 1967 Treaty on Outer Space.

1. Space activities have been carried out "in the interest of maintaining international peace and security and promoting international cooperation and understanding." (Article III). For more than a generation this new activity has been free from destructive aggression with hostile intent. Emphasis has been continuously upon peaceful benefits, *e.g.*, global communications, worldwide meteorological services, improved navigation for ships and planes, land management, health and medical advances, exploration of celestial bodies and deep space probes. We have not had a war in outer space or hostilities directed to the Earth. Reconnaissance satellites collect data as part of a peacekeeping function and must be regarded as a use of space technology to deter any outbreak of hostile activities, especially patterns of aggression that might be formed on the Earth. Even though Article IV of the Treaty is limited in prohibiting earth-orbiting objects "carrying nuclear weapons or any other kinds of weapons of mass destruction" and States Parties agree not to "install such weapons on celestial bodies, or station such weapons in outer space in any other manner," the practice for more than two decades has gone far beyond this injunction and no nation, whether or not a party to the Treaty, has carried out hostilities with weapons of less than mass destruction. This situation derives not only from compliance with the spirit of the 1967 Treaty but also from the global nature of space technology which necessitates a high degree of international cooperation in order to achieve operational efficiency. When it is considered that space science and technology can be used for both peace and war, it is no mean achievement to have built up a 23-year historical record of peaceful space functions which have benefited many people and nations. Fear that this measure of arms control, not achieved for land, air and sea, may not endure for outer space can be a positive influence gained from this perspective of the past in compelling continued and greater concentration on disarmament provisions designed for the future.

2. When the 1967 Treaty was being formulated, claims of sovereignty over outer space and celestial bodies were seen as the source of future conflicts which could disrupt

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[3]International Cooperation and Organization for Outer Space. Senate Committee on Aeronautical and Space Sciences. 89th Cong. 1st Sess. 353-354 (Doc. No. 56, 1965).

[4]*Id.* at 361-62, 372.

[5][1967] 18 U.S.T. 2410, T.I.A.S. 6347, 610 U.N.T.S. 205.

international cooperation and lead to hostilities. One of the great achievements at this time was the acceptance of Article II prohibiting national appropriation by claim, use, occupation or "any other means." Legal form was given to a customary practice. To imagine the opposite of this principle—that each State could and would make sovereign claims—is to deduce instantly the resulting chaotic international situation and to conclude that the framers of the 1967 Treaty were especially gifted with foresight in dealing with the question of sovereignty to this extent. Again, the nature of space science and technology made an indelible imprint on politics because the rapidity of orbiting satellites with global functions demanded new attitudes toward sovereignty in an unclaimed environment.

3. The third remarkable example of foresight was the inclusion of the *use* of outer space for peaceful purposes. Early drafts dealt only with *exploration* and had they prevailed, the Treaty's provisions would not have applied to all the uses of the space environment for activities performed on the Earth. By providing for the uses of outer space, all functions developed then and thereafter are covered by the Treaty, including communications, weather prediction, remote sensing, navigation, etc. Some late comers to outer space activities have assumed that the Treaty covers only those functions in existence at the time the Treaty went into force and that its provisions are not applicable to such specific functions as direct television broadcasting satellites and remote sensing by satellites. Such misconceptions may arise from lack of knowledge of space science and technology, specialization in only one type of space activity and unawareness of the total history of space applications. Lack of comprehension of the applicability of the 1967 Treaty has led to proposals which are unnecessary and therefore confuse the analysis of essential tasks that lie ahead. It is not necessary to abandon the past, explicitly the 1967 Treaty when it does not mention every conceivable use; rather, this Treaty is a foundation to be built upon when such appreciable scientific and technological advances have been made as to require more specific guidance to States in the conduct of their space activities.

4. Freedom for scientific investigation became a guideline coupled with equal access of nations to participate in space activities without discrimination. These provisions produced practical results for scientists and nations as can be seen from a study of the texts of official agreements on projects involving international cooperation.[6] Freedom for scientists to conduct research is a right which has deep roots in the past and indeed the concept is embodied in recent treaties, particularly notable in the Antarctic Treaty of 1959.[7] A concomitant feature is the privilege of disseminating the results of research. At the beginning of the space age it was assumed that any nation could contribute scientists and engineers to the enlargement of beneficial space activities and opportunities have been made available during the past twenty-three years. Similarly, Article I of the 1967 Treaty also is based upon according opportunities for all States to enjoy the freedom to explore and use outer space.

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[6]United States International Space Programs: Texts of Executive Agreements, Memoranda of Understanding, and Other International Arrangements, 1959-1965. Sen. Comm. on Aeronautical and Space Sciences. 89th Cong. 1st Sess., 575 (Doc. No. 44, 1965).

[7]Antarctic Treaty, December 1, 1959, [1959] 12 U.S.T. 794, T.I.A.S. 4780, 402 U.N.T.S. 71, entered into force for the United States on June 23, 1961.

The original two space powers—the United States and the U.S.S.R.—did not seek, either individually or jointly, a monopoly on space exploration and use. The concept that space activities "shall be the province of all mankind" was implemented by launching spacecraft and space experiments for other nations. The United States has consistently followed a policy of making its launching facilities available for peaceful purposes to numerous nations as well as to international organizations such as INTELSAT and the European Space Agency.[8] The results of U.S. space research have also been made available to the United Nations, and, in the case of LANDSAT data alone, more than 104 countries have been involved. The Soviet Union has also launched satellites for other countries and regularly reports satellite data to the United Nations.

Nevertheless, there is an assumption by the representatives of a few nations that they cannot have equal access unless they have their own launching facilities. Often such allegations are made because the spokesmen do not know the facts concerning the availability and use of launching facilities for projects conducted by their own nations. Studies could be made of individual countries that have had outstanding space programs during the past two decades and yet have not had national launching capabilities. It can also be demonstrated that it would not be economically prudent or technologically desirable for each nation in the world to build its own launching facility. Although launching capabilities can and are being expanded, there must be some accommodation between nations with due regard for cooperation in harmony with scientific and technological imperatives. This particular perspective of the past and present should enable us to make an objective study of practicable plans for launching satellites, economic and political factors, fair and equitable arrangements for guaranteeing "equal access" to activities designed to bring worldwide benefits from using outer space. This multidisciplinary problem cannot be appropriately handled by legal words alone but must be based on factual information regarding past policy and performance, a realistic appraisal of the present situation, and an appropriate plan for the future.

5. The 1967 Treaty anticipated the possibility of damage from space accidents and included provisions which were further developed by the Convention on International Liability for Damage Caused by Space Objects which entered into force on October 9, 1973.[9] Originally it was thought that a malfunctioning space object would burn up entirely in the atmosphere, and had this estimate been scientifically accurate, no legal problem would have been created; however, experience proved that space objects had "component parts" and this term is included in the 1967 Treaty as well as the Liability Convention. That this was a foresighted provision was evident when the U.S.S.R. Cosmos 954 satellite fell on Canada on January 24, 1978, scattering radioactive debris over an area the size of Austria.[10] Legal guidelines for handling this situation had been worked out prior to the creation of the problem.

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[8]Space Law: Selected Basic Documents, 2d ed., Sen. Comm. on Commerce, Science, and Transportation, 95th Cong. 2d Sess., 600. (Comm. Print. 1978). U.S. Launch Assurance Policy at 557.

[9][1973] 24 U.S.T. 2389, T.I.A.S. 7762.

[10]Galloway, "Nuclear Powered Satellites: the U.S.S.R. Cosmos 954 and the Canadian Claim," 12 Akron L. Rev. 401 (1979). *See also* Galloway, "United Nations Consideration of Nuclear Power for Satellites," Proc. 22nd Colloquium on the Law of Outer Space 131 (1980).

6. The 1967 Treaty expressed the strong motivation of scientists, engineers, politicians and the general public to protect the Earth and outer space from contamination and avoid harmful consequences from space activities. Protection of the environment has become a consistent policy enunciated in relevant international agreements.

7. State responsibility and the role of international governmental organizations were identified and added to the structure designed to head off future difficulties which might arise. Because of the analysis that had gone into the provisions on these subjects, it was easier to work out the relationships between nations and such organizations as the European Space Agency, INTELSAT, etc.

8. The framers of the 1967 Space Treaty also foresaw the possibility of an expanding role for the Secretary General and the United Nations, and in subsequent treaties on astronauts, liability, registration, the Moon and other celestial bodies, the trend has been to enlarge responsibilities, thus creating a central international point on which to focus.

9. Finally, it should be noted that while the provisions of the 1967 Treaty on Outer Space are general guidelines, they are sufficiently specific to elicit agreement concerning their meaning. Compromise has not been achieved by such ambiguity that phrases can be accorded diametrically different meanings. Success has been achieved by the method of taking a general principle and delineating it in greater detail in space treaties subsequently formulated by the Legal Subcommittee and the Committee on the Peaceful Uses of Outer Space. This practice proved its wisdom as compared to that used in the Law of the Sea negotiations where multitudinous problems and functions are incorporated in a lengthy document containing so many issues that agreement is difficult to achieve.[11] Separate attention successively applied to specific problem areas has proved its worth in achieving consensus on legal guidance for astronauts, liability for damage, registration and celestial bodies.

There were additional positive factors influencing the formation of space law which benefited from early establishment of institutions to deal with problems requiring multidisciplinary knowledge essential to working out legal solutions. International law embodying guidance for future operations cannot be shaped in a vacuum but must depend upon the interaction of other factors—scientific, technological, political, economic, and cultural. The U.N. Committee on the Peaceful Uses of Outer Space and its two subcommittees—the Scientific and Technical and the Legal—have outstanding records of accomplishment in dealing with outer space situations, particularly when compared with other specialized categories of international law. Their procedure of decisionmaking by consensus ensures the equality of all members since any one can object to a proposal, and the ultimate support of all nations represented on the Committee guarantees a firm foundation of compliance.[12] The Outer Space Affairs Division and arrangements for coordination of space activities within the United Nations are also evidence of foresight rewarded through the years by accountable results.

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[11]Informal Composite Negotiating Text/Revision 1. United Nations Third Conference on the Law of the Sea. Eighth Sess., Geneva, March 19 to April 27, 1979. Doc. A/CONF.62/WP.10/Rev. 1, 140 pp., 7 Annexes (April 28, 1979).

[12]Galloway, "Consensus Decisionmaking by the United Nations Committee on the Peaceful Uses of Outer Space," 7 J. Space L. 3 (1979).

Established international institutions for specific functions, particularly the U.N. specialized agencies, adopted space science and technology as a tool to improve their performance. The International Telecommunication Union expanded its role to include space technology for global communications. The World Meteorological Organization was ready to exercise responsibility when space technology wrought a revolution in weather prediction and associated services. UNESCO took account of the opportunities to be derived from using space technology for educational purposes. The Food and Agriculture Organization expanded its programs on the basis of information supplied by spacecraft. Ships and planes have increased safety because of space navigation projects. In fact, space technology permeated every function that could be advanced by its use.

Although the record reveals unusual and rapid adjustment internationally to concepts and institutions following the inauguration of the space age, there have been criticisms of space law and organizations. Had these criticisms come into focus in 1958 it is unlikely that the record of accomplishment could have been as strong as that which developed. The criticisms have arisen in recent years, usually in relation to problems which have not yet been solved. And these problems, which involve hard core issues not easily dissolved by compromise, come to a head in the Legal Subcommittee of the Committee on the Peaceful Uses of Outer Space. Satellites for international direct television broadcasting and remote sensing of the Earth have been under consideration for some years without achieving a consensus on total rules for international guidance. Both subjects are examples of the use of outer space and are therefore subject to the 1967 Treaty on Outer Space. To expand regulation beyond this Treaty, and beyond applicable provisions in other international law, would require a resolution of the issue of prior consent demanded by some countries which wish to approve programs before they are broadcast and give advance consent to the dissemination of remotely-sensed data. This issue stems from basic cleavages in the philosophy of government: the United States favoring the free flow of information and ideas whereas the U.S.S.R. insists upon controlling program content and data collected by remote sensing. There are adherents for each side of this question in the Legal Subcommittee.

Another question which has been discussed for many years is the definition of outer space. This question was set aside when the 1967 Treaty on Outer Space was formulated, and for some time thereafter, because it was assumed that any object in orbit was in outer space: the framers were not responsible for determining where sovereign airspace ends, scientific and technical information could not provide the basis for a decision, and no problems arose which could have been solved by an arbitrary line between airspace and outer space. The statement of the question as it now appears on the agenda of the Legal Subcommittee is practically impossible to solve because a number of elements have been added and one proposed solution will not cover all the combined aspects. Beginning with the simply-stated question of the relation of sovereign airspace and prohibitions against sovereignty in outer space, the agenda expanded the item to "Questions relating to the definition and/or delimitation of outer space and outer space activities, also bearing in mind questions relating to the geostationary orbit." This statement commingles the functional approach with the spatial question and is worded so that it can be interpreted as an effort to delimit space activities. If a purely legal approach is taken toward delimiting space activities, unnecessary prohibitions could impede desirable progress in applications of space technology. All the questions

concerning uses of the geostationary orbit cannot be solved by drawing a legal boundary line between airspace and outer space, leading to the conclusion that the geostationary orbit should be a separate agenda item. Curtailing space activities by means of a boundary line between airspace and outer space could not be the sole means of regulating international space programs or national programs with international characteristics.

It should be noted that the 1967 Treaty on Outer Space includes both spatial and functional concepts in such a manner that each or both can serve as the basis for legal guidance related to a specific objective. This is not a case of either/or spatial and functional concepts but of both being used simultaneously. There is nothing unusual about this as the same pattern exists on the Earth where identifiable functions are performed in designated geographic areas. Almost all the nations represented on the Committee on the Peaceful Uses of Outer Space are on record that the 1967 Treaty places the geostationary orbit in outer space and thus denies claims of equatorial countries to segments of that orbit. In fact, it does not seem that the Legal Subcommittee can achieve a consensus on solutions to all these related problems, many of which are not in its sole jurisdiction. The International Telecommunication Union performs a crucial function in relation to the geostationary orbit by allocation of frequencies and policy statements concerning its status as a limited natural resource. The International Civil Aviation Organization, which is undoubtedly concerned about the upper height of sovereign airspace, is evidently waiting for a request from some nation to study this matter. The agenda item on the Legal Subcommittee needs to be worded with regard to the objectives sought by defining outer space, *i.e.*, what purposes will a boundary achieve and how can these purposes be attained without impeding desirable advances in space science and technology?

This perspective on the present situation should enable us to examine possibilities concerning the future course of formulating space law within the United Nations. Looking toward the year 2000 and beyond, the objective should be to formulate a basic body of space law with the widest international acceptance. The record of the Legal Subcommittee should not be graded on the number of treaties agreed upon in the shortest period of time. General Assembly directions to the Committee on the Peaceful Uses of Outer Space and its Legal Subcommittee need not be based upon the assumption that each assigned subject should result in a resolution and/or a treaty. Some subjects should be placed on the agenda for discussion and analysis. New subjects might include legal provisions for coordination of existing institutional arrangements, a plan well suited to the expertise of official observers from United Nations specialized agencies and other international organizations. Options could be studied for the international regime envisaged by the Agreement Governing the Activities of States on the Moon and Other Celestial Bodies which was opened for signature at the United Nations on December 18, 1979.[13] The success and failure of methods employed by different international organizations could be analyzed in order to propose effective

[13]"Agreement Governing the Activities of States on the Moon and Other Celestial Bodies: History and Analysis," prepared at the request of Senator Howard W. Cannon, Chairman, Committee on Commerce, Science, and Transportation, by Eilene Galloway. U. S. Sen., 96th Cong. 2d Sess. (Comm. Print, 1980). Resolution adopted by the General Assembly on the report of the Special Political Committee (A/34/664) and on Agreement Governing the Activities of States on the Moon and Other Celestial Bodies. (A/RES/34/68 at 1-2, Annex at 3-12 (December 14, 1979).

plans for the future. Solar power satellites could receive more study in connection with possible legal proposals. Legal arrangements for space colonies could be outlined. The national space laws of each nation need to be compiled and disseminated together with information now furnished the United Nations on national space activities. Participants in the Committee on the Peaceful Uses of Outer Space and its two subcommittees should become familiar with the science and technology of space programs and interrelationships with other factors of which the law is only one. Additional effort could be made to integrate the work of the Scientific and Technical Subcommittee with that of the Legal Subcommittee. If the Legal Subcommittee meets for one month each year and considers only subjects that are basically irreconcilable, the member delegates will become frustrated over inability to form a consensus. International space problems cannot be settled by majority vote, but if consensus is reached by broad generalities which have different meanings for different nations, space law cannot be strengthened.

The most essential task for the immediate future is to increase the number of States that are Parties to the space treaties. Of the 47 nations represented on the Committee on the Peaceful Uses of Outer Space, only 14 have ratified or acceded to the four space treaties in force: Bulgaria, Canada, Czechoslovakia, France, German Democratic Republic, Federal Republic of Germany, Hungary, Mexico, Niger, Poland, Sweden, U.S.S.R., United Kingdom and the United States. Thirteen of the COPUOS members have not ratified the 1967 Treaty on Outer Space: Albania, Benin, Chad, Chile, Colombia, India, Indonesia, Iran, Kenya, Morocco, Nigeria, Philippines and Sudan. Twelve COPUOS members have not ratified the Astronaut Agreement; twenty are not parties to the Liability Convention; and 31 have not yet ratified the Registration Convention. By April, 1980, of the approximately 150 nations, the 1967 Treaty on Outer Space had been ratified by only 76 countries; the 1968 Astronaut Agreement by 71; the 1973 Liability Convention by 58, and the 1976 Registration Convention by 26.[14]

This tabulation was made prior to November 3, 1980 when the UN General Assembly by Resolution 35/16 increased the COPUOS membership by adding China, Greece, Spain, Syria, Upper Volta, Uruguay and Viet Nam, making a total of 53. Greece and Turkey will alternate membership every three years as will Spain and Portugal.

This raises another legal problem to which the Legal Subcommittee might give its attention: what is considered customary international space law? Answers to this question vary from considering the whole or part of the 1967 Treaty on Outer Space as customary international law to those who think only States are bound by each treaty they ratify. We are in the anomalous situation of having formulated a substantial body of international space law which has not been ratified on a worldwide basis and yet the practice of nations has been to abide by some principles recognized as customary international space law. Although the Legal Subcommittee should have some items on its agenda which are not being pressured into assuming treaty form, nevertheless it is a treatymaking body and should have continuous summary records of its proceedings. It is important to have the history of treaty negotiations in order to interpret provisions, and it is essential that delegates, particularly when they are newly assigned to the Legal Subcommittee, be able to inform themselves of the past history and status of current

[14]The Byelorussian S.S.R. and Ukrainian S.S.R. are listed separately as ratifying the space treaties, but the United States considers that they have been covered by U.S.S.R. ratification.

negotiations on each agenda item. It is fortunate that the summary records, abandoned during 1980 in an attempt to reduce costs, will be restored in the future.[15]

The paramount priority should be accorded to continuing and maintaining outer space for peaceful purposes. Control of armaments and the settlement of outer space disputes should be high on the list of objectives to attain in the future. The foresight we exercise for the future should equal and go beyond that with which we so successfully approached the opening of the outer space frontier.

[15]Budget Committee Votes in Favor of Restoring Services of Summary Records to Seven Subsidiary Organs of Assembly. Thirty-fifth General Assembly, Fifth Comm. U.N. Press Release, GA/AB/1980, (Oct. 24, 1980).

INTERNATIONAL SPACE LAW AND DOMESTIC LAW: PROBLEMS OF INTERRELATIONS

V. S. Vereshchetin *

1. *Interaction of International Space Law and Domestic Law in Space and Time*

The activities associated with the exploration and use of outer space are carried on not only in outer space proper, but also on the Earth. While these activities such as the development of facilities of rocket-space technology along with launching sites and operations related to the launching of space vehicles take place within the confines of a state territory they are governed, in the main, by the rules of national law. Upon emerging into outer space, these activities come, primarily, under the rules of international space law. This "geographical" delimitation of the spheres of operation of national law and international space law, however, is valid only to the extent to which we can speak about a predomination of one or another system of law.

International space law regulates the relationships among states and among other subjects of international law in connection with their activities in outer space not only subject to the place of the said activities, but also subject to their nature and time of performance. A combination of the three mentioned factors, namely place, nature and time, directly influences the sphere of operation of definite rules of international space law. Thus, the provisions of the Outer Space Treaty[1] in Article IV, prohibiting any military activity on the moon and other celestial bodies, strictly determine the place and nature of the activity. The obligation, provided for under Article IX, to avoid harmful contamination of outer space and celestial bodies and adverse changes in the environment of the Earth resulting from the introduction of extraterrestrial matter is primarily associated with the nature of activities both on the earth and in outer space. Operations related to the rescue and return of cosmonauts in distress and recovery of space objects regulated by the Rescue Agreement[2] provide for the activity on the Earth. Space objects come under international space law, as a rule, beginning with their launching into outer space.

Thus, we see that rules of international space law are space, function and time oriented and are designed for application not only in outer space but in aerospace and on the surface of the Earth. Naturally, when these rules are to be applied on a territory

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*LL.D., Vice-Chairman of Intercosmos, Moscow.

[1]Treaty on Principles Governing Activities of States in the Exploration and Use of Outer Space, Including the Moon and Other Celestial Bodies, January 27, 1967, 18 UST 2410, T.I.A.S. 6347, 610 U.N.T.S. 205. (effective Oct. 10, 1967). For the Russian text, see: Reports of the Supreme Soviet of the U.S.S.R., 1967, No. 44, at 588 (hereinafter cited as the Outer Space Treaty).

[2]The Agreement on the Rescue of Astronauts, the Return of Astronauts and the Return of Objects Launched into Outer Space, April 22, 1968, 19 U.S.T. 7570, T.I.A.S. 6599, 672 U.N.T.S. 119 (effective Dec. 3, 1968). For the Russian text, see: Reports of the Supreme Soviet of the U.S.S.R., 1969, No. 6 at 31 (hereinafter cited as the Rescue and Return Agreement).

of a sovereign State, questions arise about the interrelation of international and national legal orders and the legal force of international rules within the framework of a national legal order.

To a certain extent, the rules of domestic law which govern the activities in outer space also are characteristic of the spatial and the functional approach. Though these rules are primarily designed for operation within a country and in terms of territory do not extend to outer space proper, their sphere of operation covers people and objects in outer space.

In other words, there is a reciprocal "penetration" of international space law and domestic law into areas which may be the appropriate spheres of their primary regulation. This, however, is not a spontaneous process, rather a deliberate one, necessitated by the complexity of interrelationships of national and international space activities.

The general treaties on space, in a number of instances, provide directly for the operation of rules of domestic law in outer space. In keeping with the rules of national law we see the exercise of the jurisdiction and control over space objects and "over any personnel thereof" while in outer space or on a celestial body. Ownership of space objects launched into outer space and of their component parts can also be regulated by national law.[3]

A specific feature of the interaction of international and national legal orders in outer space is the link-up with the law of the State where the space object is registered. This important provision of the Outer Space Treaty reduces, though it does not completely exclude, the probability of collisions of national legal orders of different States in outer space. In keeping with the mentioned Article VIII of the Outer Space Treaty, a State on whose registry an object launched into outer space is carried retains jurisdiction and control over such object and over any personnel thereof: *i.e.* the jurisdiction of the State of registry becomes thereby exclusive and prevailing over all other possible legal bases, for instance, nationality of crew members or the right of ownership of the space object.

Though prior to the flight and upon its completion, space objects and their crews may be under the jurisdiction and control of other States, rather than the State of registry, for instance, when the flight is performed by an international crew, while they are in outer space, the exclusive rights of jurisdiction and control belong to the State of registry. This State, however, should assure that the operation of the space object and of its crew towards which it exercises its jurisdiction and control should be in full compliance with the requirements of international space law. Hence the registration of a space object is not a voluntary act; it may be exercised only by the State which stands in real relation to the space object and its crew and which can effectively control and regulate their actions.[4]

Since outer space is mainly a sphere of activities of international rather than of national orders, the terms "jurisdiction and control" rather than sovereignty are used in treaty rules of international space law when identifying rights and powers of States towards space objects and their crews. It is understood that the scope of rights and

[3]Outer Space Treaty, art. VIII.

[4]For greater detail, see Vereshchetin, "Legal Status of International Space Crews", 3 Ann. Air & Space L. 546-552 (1978).

powers ensuing from jurisdiction is not as broad as the rights and powers inherent in sovereignty as a whole. It is, however, indubitable that jurisdiction and control, which are spoken of in space treaties, represent an aspect of sovereignty and incorporate the rights and powers to exercise legislative, judicial and administrative authority towards personnel and objects in outer space, including celestial bodies. As it is properly pointed out by a well-known U.S. specialist in international space law, S. Gorove, "traditional aspects of territorial sovereignty are the ones that have been abolished in relation to outer space; but the functional aspects of sovereignty, the exercise of sovereign rights and similar manifestations, continue to be recognized."[5]

The problem of competing national jurisdictions in outer space has not been fully resolved. The problem could become very pressing in the future if several states contribute to the development of large-size assembled structures in outer space and subsequently of international space communities. However, the link-up with the law of the State of registry makes a positive solution rather easy at the present level of exploration and use of outer space. The situation is more complex in the event of an emergency landing of a space object and its crew beyond the territory of its own State. In a given situation the law of the State of registry is no longer the sole national law covering the space object and its crew.

It is not without interest in this connection to see the alteration of the legal status of a space object and its crew subject to the factors of time and place, and also to the nature of interaction of international space law and the national law of different states.

Before the launching of a space object the activity related to its development and the preparation for launching is, as a rule, completely in the sphere of national regulation of the given state. Its legal status is determined by the rules of domestic law. However, even in this stage, the state is obliged to observe a number of requirements of international space law, for instance, not to install weapons of mass destruction on objects designed to orbit the Earth, and to ensure, whenever necessary, certain measures are taken to avoid harmful contamination of a celestial body. Besides this, in case of a joint development or launching of a space object, its legal status for instance, ownership relations, may be largely determined by an appropriate bilateral or multilateral agreement of the collaborating states.

Beginning with the launching of the space object or its construction in outer space including celestial bodies, it comes, primarily, under the rules of international law. The Liability Convention[6] in Article I clarifies that the term "launching" includes attempt launching. This means that in case of damage, as it is provided for by the Convention, even in case of an unsuccessful launching, the relations of international legal liability arise.

While in outer space, including celestial bodies, a space object does not sever its legal relationship with its State, provided one important condition is observed: it has to be on the registry of the given State. All other possible legal bases, for relation to the space object, besides registry, while the object and its crew are in outer space have a

[5]Gorove, "Sovereignty and the Law of Outer Space Reexamined", 2 Ann. Air & Space L. 321 (1977).

[6]Convention on International Liability for Damage Caused by Space Objects (hereinafter "Liability Convention"), March 29, 1972, [1973] 24 U.S.T. 2389, T.I.A.S. 7762 (effective Oct. 9, 1973). For the Russian text, see: Collection of operative treaties, agreements and conventions concluded by the U.S.S.R. and foreign states. 29 M. Mezhdunarodnye Otnosheniya Publishers 95-101 (1975).

secondary, subordinate role. As it was shown earlier, the State of registry acquires not only the right of exercising exclusive jurisdiction and control over a space object and its crew but shall bear responsibility for assuring that their activities are carried out in conformity with the provisions of international space law. The right of ownership of space objects and of their component parts while in outer space is retained by the same States, juridical entities or physical persons to whom they belonged prior to the flight.[7]

Upon return to the Earth the legal status of a space object and of its crew changes again. From that moment it depends largely upon the place of landing: a) the territory of the launching State, b) the territory of some other State, or c) the territory not under the jurisdiction of any state such as the high seas or the Antarctic. In the first case, the specific rules of international space law are no longer applicable to the object and its crew; they come fully under the national law of their country. In case of an international launching, their further legal status is determined by agreement among the cooperating states.

In case of an emergency landing on a foreign territory, the space object and its crew remain in the sphere regulated by international space law such as the order of search and rescue and the liability for damage. Simultaneously, they come under the operation of two or more competing national jurisdictions: the State on the territory of which the object and its crew landed, the State of registry, the launching State, the State which owns the space object or the State (s) whose nationals are members of the crew. A similar problem of competing jurisdictions might arise in the event of the space object landing on the high seas or any other area not under the jurisdiction of any state.

The choice of jurisdiction in such situations has not been specifically regulated by international space law. As for the crews, it follows from Article V of the Outer Space Treaty and Article IV of the Rescue Agreement, which make prompt return of cosmonauts in distress obligatory, that preference should be given to the jurisdiction of the State of registry.[8] The same State, most likely, should be given the preference to exercise jurisdiction in case the cosmonauts land on the high seas. The treatment of cosmonauts as "envoys of mankind in outer space" in Article V of the Outer Space Treaty does not free them from the responsibility to stringently comply with the laws of the State in which they happen to stay as a result of an emergency landing. In the event of an intended, unauthorized landing on a foreign territory, the prevailing jurisdiction is that of the territorial sovereign.

Selection of jurisdiction in relation to the space object itself may present difficulties. At the same time, the responsibility established by Article VIII of the Outer Space Treaty and Article V of the Rescue Agreement, of the state on whose territory a space object has been found is to return that object or its component parts upon request of the State of registry as per the Outer Space Treaty or "launching authorities" as per the Rescue Agreement. This should most likely be interpreted to mean that under international space law the factors of registry and place of launching of a space object prevail over other possible bases for jurisdiction. It also should be taken into

[7]Outer Space Treaty, art. VIII.

[8]It should, however, be borne in mind that the Outer Space Treaty, art. V, provides for the return of cosmonauts "to the State of registry of their space vehicle," while the Rescue and Return Agreement, art. IV, states the return "to representatives of the launching authorities."

consideration that the ownership of space objects and of their component parts is not affected by their return to the Earth.

The question of competing jurisdictions over space objects might arise also in the event of the passage of air space of foreign States or over the high seas on its way to outer space or during its return to the Earth. True, the probability of such a question arising in practice is slight owing to the briefness of the stay of an object in air space and because the rule of free passage of a space object in the air space of other states during take-off or landing is finding increasing recognition. As for maneuvering and other operations in the air space of another state, they definitely call for advance agreement of the territorial sovereign.

Space activity, thereby, is regulated by international law and by domestic law. The degree of influence of one on the other system of legal rules upon this activity depends upon the place, nature and time of the activity. The international legal aspect of activities in outer space is regulated in greater detail than that of national. National space laws of even large powers are but in the embryonic stage. The rules of international space law determine the framework of operation of national jurisdiction in outer space and only outline the ways of avoiding collisions of national jurisdictions on the Earth.

As space studies and their applications become further extended and more complex, a better developed mechanism of legal regulation within and among states shall be necessary. However, the elaboration of international space law and of national space law and their relationship and coordination cannot be channeled into developing "an integrated legal system for space" as some lawyers believe.[9] Two independent systems of law, international and national, can be coordinated, concerted and made consistent but not integrated into a single system. This gives rise to another important question, the mechanism of application of international space law within a given State, the binding force of its rules for the organs of a State, organizations and physical persons.

II. Implementation of the Rules of International Space Law Within the Sphere of Domestic Law

The exploration and use of outer space is carried on by means of automatic and manned space vehicles which are designed, developed, launched and controlled in outer space not by States as such, but by concrete state owned or private entities. Space flights are performed by nationals of definite countries. This means that space activities of *States* which are the subject of space treaties and for which States bear international legal responsibility are actually implemented by *juridical entities and physical persons.*

Hence, there exists the legal problem of the binding nature of international space law provisions for state owned or private entities and for individuals. Since the subjects of international space law, as of a branch of international public law, are states and intergovernmental organizations, rather than the juridical entities and physical persons, the problem should be resolved in the context of the general theory and practice of relationship of international and domestic law. In more concrete terms it is associated

[9]DeSaussure, "An Integrated Legal System for Space", 6 J. Space L. 179-192 (1978).

with the rules of implementation of international treaties in conformity with the national legislation of different states.

In settling the problem in the light of the mentioned general standpoint one must take into consideration the specific nature of legal regulation of space activities. These specifics are manifested, in particular, as follows. Firstly, national space law, thus far, is still in its formative period, and in most countries non-existent. Hence, the urgency of the question exists in intrastate relations concerning the possibility of applying the rules of international space law which, as it is known, is based in the main, on treaties. Secondly, a number of rules of international space law seem to be directly addressed to physical persons and juridical entities. Thus, Article V of the Outer Space Treaty states, "In carrying on activities in outer space and on celestial bodies, the *astronauts* of one State Party shall render all possible assistance to the *astronauts* of other State Parties" [emphasis added]. Article VI of the same treaty determines that "the activities of non-governmental entities in outer space. . . shall require authorization and continuing supervision by the appropriate State. . .".

In several recent years, in connection with the adoption of the New Constitution of the USSR (1977) and the Law on the Order of Conclusion, Execution and Denunciation of International Treaties of the USSR (1978)[10], a number of papers by Soviet lawyers specializing in international affairs have been published touching specifically or indirectly on the problems of the relationship of the international and domestic law.[11] These questions have been discussed at the annual meeting of the Soviet Association of International Law in 1979.

The Soviet theory of international law is undivided on the fact that international law and domestic law are two independent legal systems which function in different spheres while being closely interrelated. Neither of them, as a complete system, prevails over the other but both are under strong reciprocal influence and are in need of coordination.

Since we regard international and national law as two legal systems operating in different spheres, we are bound to make a logical conclusion that the rules of national law, provided they have not also become treaty or customary international rules, cannot regulate international relations; and the international legal rules which have not become national rules, cannot regulate domestic relations. At the same time, however, it should not be overlooked that while the rules of national law express the will of only one sovereign State and are not therefore binding for other States owing to the principles of sovereign equality and independence of States, the rules of international treaties, a party of which is a given State, reflect the will of that State too.

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[10]Subsequently referred to as the Law of 1978. See its text in the Reports of the Supreme Soviet of the U.S.S.R., 1978, No. 29, art. 439.

[11]*See* Usenko, "Theoretical Problems of the Relationship of International and Domestic Law," 1977 Soviet Y. B. Int'l. L. 57-90; Lukashchuk, "The Relationship of the Domestic and International Law in the Light of the New Constitution of the U.S.S.R.," 8 Mezhdunarodnye Otnosheniya i Mezhdunarodnoye Pravo 313 (1979); Tunkin & Mullerson, "The Law of International Treaties of the U.S.S.R.," Sovietskoye gosudarstvo i pravo, 1979, N 2, p. 22-31; Talalayev, "The Law of International Treaties," M. Mezhdunarodnye Otnosheniya 161-165 (1980); Talalayev, "The Law of International Treaties of the U.S.S.R. in the Service of Peace," M. Yurdicheskaya Literatura 41-60 (1979).

Having undertaken an international treaty obligation, a State owing to the principle of *pacta sunt servanda* is bound to undertake all the necessary measures to prevent the violation of the obligation by actions of its physical or juridical entities. International law leaves the choice of the relevant techniques and means to the discretion of the State concerned, without predetermining the mechanism of the national implementation of the rules of international law.

With the idea of observing its international obligations a State may adopt special laws or other normative acts which create, alter or repeal domestic rules and thus, seemingly transform international legal rules into rules of national law which is the so-called transformation act[12]. We use the expression "seemingly transform" because, in real fact, we deal in such cases not with a transformation of international rules into domestic ones, but with the emergence of domestic rules which correspond to international ones.

Wide use is also made of different types of the so-called acts of referral or referral rules which do not establish new rules of national law, but rather authorize the application of rules of international treaties to one or another area of internal regulation.[13] Most likely, requests addressed to State and other organizations and persons to take guidance from the provisions of an international treaty, which are made sometimes upon ratification (approval) by the supreme authority of the State might be considered a form of referral. However, even in the absence of specific transformation or referal acts, it is improper, to our mind, to conclude that in this event, provisions of international treaties, which are binding for a given state, may be viewed as unobligatory by state organs which are responsible for the observance of state commitments. Such a conclusion would be directly contradicting the principle of observing in good faith international treaties by states. It would be more proper to conclude that in this event, a State taking guidance from certain considerations had found it unnecessary to issue a specific internal act, in the understanding that even in its absence the treaty provisions would be observed by the relevant organs. In this case, the ratification (approval) of a treaty can be viewed as a tacit authorization of its application by appropriate organizations. A different interpretation would be tantamount to a State failing to create the necessary national normative ordinances and deliberately giving way to violations of its international legal obligations.

The intrastate binding nature of international legal rules sets the moment a treaty enters into force for the given state. It is therefore important that it should be timely published or in any other way brought to the notice of the organizations and entities concerned. As it was indicated earlier, in some cases, this is accompanied by the institution of appropriate rules of national law; in other cases, the matter at issue is simply the application of definite rules of international treaties in the internal sphere of a state. It is known that international and national rules differ by their legal and social nature. It is therefore, not always expedient or possible to "transform" international

[12]A number of Soviet authors use the term "transformation" in a broader meaning of the word to designate any juridical relationship of international and national law. According to these authors, the application of international rules to national sphere is impossible without transforming them into rules of national law. See more about this in Usenko, *supra* note 11, at 67-80.

[13]*See* Tunkin & Mullerson, *supra* note 11, at 29.

rules into national. At times it is simply enough to apply the requirement of international treaties by competent organs. This is besides saying that there is the category of the so-called "selfexecuting" treaties which relate only to the state as a whole.

It should be also borne in mind that all the known juridical-technical models of domestic observance of international treaties have their advantages and drawbacks. Let us say, that simply to declare all international treaties concluded by a given state a part of the law of the land does not, as such, guarantee the observance of the provisions of these treaties in the domestic sphere. Thus, in the U.S.A. where this formula is adopted under Article VI of the Constitution, there operates, according to American lawyers, a rule in keeping with which "federal statute prevails not only over a previous statute, but also prevails over previous international treaties and agreements."[14] In other words, the national law of the United States being placed on an equal standing with the rules of international treaties might repeal the operation of the latter in the internal sphere following the principle of *lex posterior derogat prior* and thus entail the violation of international obligations contrary to the principle of *pacta sunt servanda.* Besides this, the treaties, though they are declared "the supreme law of the land," require an implementing legislation to be operative in U.S. courts.[15]

Let us now turn to the relevant rules of Soviet legislation. Article 29 of the Constitution of the U.S.S.R. determines that "the U.S.S.R.'s relations with other states are based on. . . fulfillment in good faith of obligations arising from the generally recognized principles and rules of international law, and from the international treaties signed by the U.S.S.R.". This means that the generally recognized international legal principle of observing in good faith international obligations is also a constitutional principle in the Soviet Union.

The Constitution of the U.S.S.R. just as the constitutions of the majority of other countries, does not contain a general provision regarding the order of operation of international legal rules in the territory of the U.S.S.R. or regarding the order of settling collisions between national and international legal rules. At the same time, as it is correctly pointed out by I.I. Lukashchuk, "constitutional formalization of the principle of observance of international obligations in good faith means that all organs, organizations and individuals who come under the operation of Soviet law are bound to respect rules of international law. This obligation arises from the Constitution itself and does not require a confirmation by an additional legislative act."[16] We may add that Soviet legislation does not make this obligation subject to some preliminary condition of embodying rules of international law into rules of Soviet domestic law.

The need in appropriate national normative acts is determined by the Council of Ministers of the U.S.S.R. which is instructed to take measures to assure the observance of international treaties signed by the U.S.S.R.[17] Suggestions about the adoption of acts of

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[14]Gorove, "Legal Aspects of the Space Shuttle," 13 Int'l Law. 157 (1979).

[15]DeSaussure, *supra* note 9, at 185; Gorove, *supra* note 14, at 157-58.

[16]Lukashchuk, *supra* note 11, at 9.

[17]Art. 131, § 6 Constitution of the U.S.S.R. and art. 20 of the Law of 1978, *supra* note 10.

domestic law necessary for the observance of an international treaty signed by the U.S.S.R. are submitted by ministries, State Committees and administrations of the U.S.S.R. concerned, upon agreement with the Ministry of Justice of the U.S.S.R. as per Article 24 of the Law of 1978. These State organs may issue also their own normative acts if they are necessary and would assure the observance of international obligations.

The provision of the Law of 1978, namely that "ministries, State Committees, administrations of the U.S.S.R., Councils of Ministers of Union Republics and other state organs whose sphere of competence covers questions regulated by international treaties of the U.S.S.R., assure the fulfillment of treaty obligations undertaken by the Soviet side" . . . is of a fundamental importance for the question which we are considering (Article 21). This provision of the Law of 1978 directly provides for not only international legal, but also the national legal binding character of the treaties, a Party to which is the Soviet Union.[18] Again, the binding nature is unconditional and not subject to a preliminary embodiment of international legal rules into rules of domestic law.

It may be concluded from all this that, according to Soviet legislation, provisions of international treaties concluded by the Soviet Union even in the event when no corresponding national normative act has been issued are binding for the state organs within their terms of reference.

As it was mentioned earlier, the Constitution of the U.S.S.R. does not carry any general rule in case of a collision between the rules of Soviet law and rules of international treaties. At the same time, a number of laws of the U.S.S.R. and of Union Republics stipulate that in case of such collisions, the rules of international treaties should be applied. Such formulations are included into the fundamentals of Soviet legislation for 20 spheres of regulation which make it possible to speak about an emerging principle.[19] Considering, however, that this rule is not on record as a general rule in the Law of 1978, it would most likely be premature to extend it automatically to all possible cases of collisions between the rules of the law and of the treaty.[20]

With the idea of avoiding such collisions, the Law of 1978 provides for a number of measures, both in the stage of preparation, conclusion and ratification of international treaties, and in the process of their internal implementation. Thus, in keeping with article 6 of the Law of 1978, "suggestions to conclude international treaties of the U.S.S.R. which establish other rules than those contained in Soviet legislation are submitted to the Council of Ministers of the U.S.S.R. upon agreement of the Ministry of Justice of the U.S.S.R."

This requirement of the Law makes it possible, in case of need, to begin the process of coordination of the rules of domestic law and the provisions of the future treaty at a very early stage. The same objective is in the requirement of the Law about obligatory ratification of treaties which establishes other rules than the ones contained in legislative

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[18]Tunkin & Mullerson, *supra* note 11, at 28.

[19]*See* A.A. Gromyko, Report at the Session of the Supreme Soviet of the U.S.S.R. on the Draft Law on the Order of Conclusion, Execution and Denunciation of International Treaties of the U.S.S.R. Pravda, July 7, 1978.

[20]Another point of view is offered by Lukashchuk, *supra* note 11, at 10-11; G.V. Ignatenko and D.D. Ostapenko (eds.), International Law 82 (1978).

acts of the U.S.S.R. (Article 12, Part 1). Finally, to fulfill international treaties of the U.S.S.R., as it was already mentioned earlier, whenever necessary, a provision is made for the institution of specific legislative acts, the suggestions about adoption of which should be agreed upon in advance with the Ministry of Justice of the U.S.S.R. In those cases when collisions are possible with other rules of national law, such acts usually authorize the application of appropriate provisions of an international treaty. The system of mentioned measures minimizes the possibility of collisions between domestic and international rules of law.

The important practical conclusion arising from these provisions of Soviet legislation for the area of space law, which is of interest to us, is as follows. Despite the fact that the ratification of multilateral general treaties on space was not accompanied by the adoption of specific national normative acts in the Soviet Union in addition to the Decrees about their ratification, the provisions of these treaties are legally binding not only for the State as a whole in international relations, but also for appropriate State organs and organizations which, within their competence, should apply them in their work associated with the exploration and use of outer space.

ENERGY FROM SPACE: AN IMPERATIVE FOR INTERNATIONAL COOPERATION

Stephen Gorove *

One of the most important problems that the international community will have to face in the years to come has to do with finding a long-term solution of how to satisfy the ever-growing energy needs of the world, a problem which has become more acute in view of the dwindling supplies of conventional fuel. One major proposal relates to the utilization of solar energy for the generation and transmission of huge amounts of power from geostationary satellites by microwave or laser beams down to earth for conversion into electricity and eventual terrestrial use.[1]

It is anticipated that many technical problems will have to be resolved and very large financial outlays made before solar power satellites (SPS-s) can become operational. It is also anticipated that there will be international implications such as, for instance, those arising from the utilization of geostationary orbit,[2] frequency allocation and the impact of microwave or laser beams on the environment.[3]

In view of these considerations, one of the key issues that policymakers will have to face is whether the SPS system, its research and development, should be internationalized and, if so, in what manner.

In order to arrive at a rational decision, a careful assessment must be made of the pros and cons of internationalization with reference to the totality of the basic value and institutional processes rather than on the basis of a single value or institutional alternative. Positive or negative answers may well depend on the meaning of the term "internationalization" and various possible forms which it may assume.[4] A full-fledged analysis of the policy choice whether or not to internationalize should also take into

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[1]For details, *see* Glaser, Power from the Sun: Its Future, 162 Science 857-886 (Nov., 1968).

[2]A comprehensive analysis of the legal implications of the utilization of geostationary orbit may be found in Gorove, The Geostationary Orbit: Issues of Law and Policy, 73 Am. J. Int'l L. 448 (1979).

[3]Many of the international and domestic issues have been investigated in studies initiated by the U.S. Department of Energy and the National Aeronautics and Space Administration. See, for instance, Carl Q. Christol, Satellite Power System (SPS)—International Agreements (DOE/NASA, 1978); Stephen Gorove, Satellite Power Systems—International Agreements (U.S. Dept. of Energy, 1978); see also C. E. Bloomquist, A Survey of Satellite Power Stations (PRC Systems Sciences Co., Los Angeles, 1976); ECON, Political and Legal Implications of Developing and Operating a Satellite Power System—Final Report (Princeton, 1977).

On microwave exposure standards, *see* Gorove, Legal Aspects of Solar Power Satellites; Focus on Microwave Exposure Standards, Proc. 22nd Colloquium on the Law of Outer Space 1 (1980).

[4]"Internationalization" may be viewed to include bilateral as well as multilateral (regional or global) agreements for the establishment of international cooperation pertaining to SPS research and development. See Gorove, Internationalization of Solar Power Satellites: Some Legal and Political Aspects, Proc. 23rd Colloquium on the Law of Outer Space 169, at 173 (1981).

account other schemes of proposed internationalization such as, for instance, the international regime governing the exploitation of the deep seabed or the resources of the moon and other celestial bodies. Their relevance or lack of relevance with respect to the internationalization of SPS should be clearly determined.

One major conclusion of a study of pros and cons could be that, in view of the anticipated huge financial outlay required for the development of SPS, it would appear to be in the general interest to have the costs of research and development spread not only domestically between government and private enterprise but also internationally among nations of the world.[5]

Another major conclusion could be that if the Agreement Governing the Activities of States on the Moon and Other Celestial Bodies[6] is ratified without reservation by the technologically advanced countries, the establishment of an international regime to govern the exploitation of solar energy through SPS, as such exploitation is about to become feasible, will likely be regarded by an overwhelming majority of States an obligation to be carried out in good faith by the Parties.[7]

Still another conclusion may be that a policy of internationalization would appear to reflect both altruism and enlightened self-interest: on the one hand, solar power as a spacial resource would be used for the benefit of mankind and, on the other hand, an international pool would be cost-saving. An additional advantage of such policy would be that it would undercut any argument by the developing nations that the current system is inequitable inasmuch as the benefits of outer space utilization accrue only to the space powers.

Yet another conclusion of a study of pros and cons could point to the disadvantage of sharing control over the SPS, should the developed countries have to accept such sharing as the price of internationalization.

Once the preference for internationalization of SPS as a policy option is established (and it is urged that it should be established soon), the developed nations should seriously consider taking global, near-global, regional or bilateral initiatives to pool material and human resources for the development of SPS programs. As one of their policy options, the technologically advanced countries could take a positive role in calling for an international pool of resources to help in the assessment of the feasibility, benefits and impediments associated with the development of satellite power systems and eventually assist in the development itself. Such scheme could include participation by all countries in some form, through their contributions to natural and human resources needed for the SPS program. Contributions could be taken into account when the eventual benefits would be reaped after the SPS system became operational. This would be to the advantage of all participating countries in that benefits would accrue

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[5]Stephen Gorove, Satellite Power Systems (SPS)—International Agreements 44*ff.* (U.S. Dept. of Energy, 1978).

[6]For a text of this Agreement, commonly referred to as "Moon Agreement", see Annex to the U.S. General Assembly Resolution (Doc. A/RES/34/68 of 14 December 1979) which called for the widest possible adherence to the agreement.

[7]A detailed analysis of some of the legal and political considerations leading to this conclusion may be found in Gorove, Internationalization of Solar Power Satellites: Some Legal and Political Aspects, Proc. 23rd Colloquium on the Law of Outer Space 169 (1981).

commensurate to the amounts of contribution. Key issues will include the criteria on the basis of which human and material resources will be evaluated and also the question whether or not the total contribution by a single country or a group of countries ought to be the sole factor in determining the distribution of eventual benefits.

In the implementation of its proposal the developed nations may conveniently utilize almost all avenues of international cooperation to arrive at an agreement. On the politico-legal level the global approach may be initiated at the United Nations both before the General Assembly and the Committee on the Peaceful Uses of Outer Space (UNCOPUOS) and its legal subcommittees. With global approach at the technical level, the resources and rich experience of ITU-related bodies should be fully utilized in helping to investigate all relevant aspects of the SPS, including the effects of massive microwave power transmission on radio services. The technical Subcommittee of UNCOPUOS may provide further input and guidance as necessary. Specialized agencies, such as UNESCO and WHO, may also be called upon for assistance in their areas of competence.

On a less than global level, the experience in the field of international satellite communications may provide useful insights to draw upon for possible framework. Regional agreements in some regions may be more difficult to negotiate but opportunities for such should be explored. Insofar as bilateral cooperation is concerned, current research agreements on solar energy between some countries could be amended to include cooperation in the development of SPS in whatever form it may be agreed upon. Alternatively, entirely new bilateral or multilateral agreements may be concluded involving both developed and developing nations.[8] Appropriate bilateral agreements may also be considered with international regional organizations.

Initially, possibly for the next three-five years, these agreements could aim mainly at coordinating feasibility studies, including effects of microwave power transmission on humans and biota as well as on radio services, research of technical problems, determinations of appropriate sites for receiving antennas, and meeting of experts and many other matters. Possibly, some of these topics (such as exchange of information, coordination of research) are already covered in some current bilateral agreements pertaining to solar energy and, to that extent, this may facilitate negotiations. In the conduct of negotiations, the Parties may wish to proceed on a case-by-case basis taking into account their general relations.

Insofar as specific initiatives for internationalization of the SPS system are concerned, it appears reasonable to assume from past experience that the global options would likely encounter more difficulty than the regional or bilateral arrangements. A great deal may depend on the nature and content of the proposed arrangements, the international political climate, bilateral relations, anticipated benefits and deprivations, and many other factors.

There appears little reason that would prevent the developed countries from pursuing virtually all of the indicated international avenues simultaneously. Past experience, for instance, in the field of development of international agreements for safeguarding the peaceful utilization of atomic energy show that the United States entered into many bilateral agreements while it simultaneously championed the

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[8]For an elaborate discussion, see Gorove, Solar Power Satellites: Framework for an International Cooperative Agreement, Proc. 23rd Colloquium on the Law of Outer Space 165 (1981).

establishment of the International Atomic Energy Agency which for many years did not come into existence.

International arrangements on whatever scale (bilateral, multilateral, regional, near-global or global) would appear to give the SPS program a substantial boost both psychologically (prestige-wise) and materially, particularly if all or most of the developed and developing countries participate. As intimated beforehand, it would also take off the edge of the charge of injustice and inequity advanced by many developing nations. Also, once such agreements are negotiated, it is unlikely that countries would create difficulties in relation to the use of the geostationary orbit by invoking claims of sovereignty or the "common heritage" principle or with respect to frequency allocation or perhaps even exposure standards. All in all, a cooperative program on the international level would likely speed up rather than retard the development of the SPS.

Should an international cooperative effort for the development of the SPS prove completely unsuccessful—which appears somewhat unlikely—and should the Moon Agreement not be ratified or ratified with reservation pertaining to SPS utilization, the technologically advanced countries could still continue their own development programs and put their conscience to rest in the firm knowledge that current practices and recognized principles of international law are fully supporting the principle of freedom of use of outer space and that they have made a good faith effort to attempt to implement in a concrete manner the "common interests" principle of the 1967 Outer Space Treaty[9] and open the door for wide international participation in the SPS program on the basis of equity and fairness.

[9]See Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, Including the Moon and Other Celestial Bodies, January 27, 1967 (effective October 10, 1967), [1967] 18 U.S.T. 2410, T.I.A.S. 6347, 610 U.N.T.S. 205, Art. 1.

ESSENTIAL FEATURES OF INTELSAT: APPLICATIONS FOR THE FUTURE

David M. Leive *

Introduction

International cooperative activities in outer space are increasing and will require a variety of institutional forms, mechanisms and approaches. This article will focus on some concepts concerning the ways in which these activities can be organized. These concepts are drawn from the experience of one particular international organization, the International Telecommunications Satellite Organization (INTELSAT),[1] dealing with one particular set of space-related activities: space communications. This experience, however, may have some broader applicability not only to space-related activities but also to other areas of international cooperation as well.

It should be emphasized that INTELSAT is not a model. It is not possible to take one organization developed in one context and at a particular time and simply apply it in another context and at another time. Morever, INTELSAT deals with satellite communications, which is only one small part of the range of outer space activities. But the particular institutional features and mechanisms of INTELSAT are not limited to or only reflective of problems concerning satellite communications. Rather, they can be regarded as responses or solutions to particular sets of problems or needs.

This article addresses five specific problem areas: *first,* the question of timing the institutional arrangements; *second,* the question of combining political and technical aspects; *third,* the question of management; *fourth,* the interrelated questions of finance and control; and *fifth* the matter of technology transfer.

1. The Problem of Timing the Institutional Arrangements

It goes without saying that it is not easy to judge the right time to establish an international institution and its set of arrangements. In areas with a heavy technological component, there is the risk of being premature and acting before the technology, or perhaps more accurately, the application of the technology, has sufficiently jelled to permit a realistic assessment of the most appropriate institutional arrangements. Sometimes, even if the technology is defined and its application is clear, it may not be possible, for political or other reasons, to reach agreement on institutional arrangements. In short, institutional arrangements do not exist in a vacuum.

It also may not be wise to place too much reliance on the existence of an amendment process later to revise institutional arrangements in the light of experience. Many international agreements, particularly those establishing institutional arrangements, are a bundle of interrelated compromises adopted as a single package

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[1]Agreement Relating to the International Telecommunications Satellite Organization, INTELSAT, August 20, 1971, [1971] 23 U.S.T. 3813, T.I.A.S. 7532.

after a long struggle. It may be very hard to start amending one aspect without having a "ripple effect" on other interrelated aspects. Moreover, once a precedent is established to commence the process of amending an agreement, the door may be opened to frequent amendments or attempts at amendments on a wide range of matters. Consequently, there may be a strong reluctance to commence using the amendment process for adjusting the institutional arrangements to changing conditions, even if specific changes can be amply justified.

Concerning timing, the choice does not have to be between all or nothing—between *either* establishing a complete set of international arrangements *or* deferring any action until a later date. This *either/or* choice is a fallacy. In this respect, one aspect of the INTELSAT arrangements—involving a phased transition in the establishment of the Organization—may have some general applicability.

INTELSAT was established on an interim basis in 1964 by an "Agreement Establishing Interim Arrangements for a Global Commercial Communications Satellite Consortium,"[2] which clearly contemplated that it would lead to a permanent or definitive form of organization. A time period was specified in the Agreement for a study to be conducted by the international governing body, called the Interim Committee, and submitted to all members. The report was to consider: "among other things, whether the interim arrangements should be continued on a permanent basis or whether a permanent international organization with a General Conference and an international administrative and technical staff should be established."[3]

The 1964 Agreement provided for the convening of an international conference to consider the report and set a target date of 1970 for the entry into force of definitive arrangements adopted by the Conference. However, no fixed deadline was set for the end of the interim arrangements and for the transition to permanent arrangements; in the absence of agreement, the interim arrangements as a formal matter could have continued indefinitely.

In 1964, when the interim arrangements were established, it was premature, both technically and politically, to establish a permanent international organization with a sufficiently large degree of authority to manage fully a complex activity such as the global communications satellite system. In that early stage of space activities, the technology and expertise resided largely in one country, the United States. At the same time, the nature of the activity—establishing paths of communications between nations—required some form of international cooperation. Thus, it was not too early to set up some international framework and to make provision for a later transition to a more permanent arrangement.

The international negotiations to establish these permanent arrangements, which stretched over more than a two-year period from 1969 to 1971, were far harder to accomplish than setting up interim arrangements of course, because the arrangements were to be permanent. Yet here, too, the issue that proved to be the most difficult one to resolve concerned the shift from management of the system by a national entity to management by the international organization itself. The *either/or* dilemma referred to

[2]Agreement Establishing Interim Arrangements for a Global Communications Satellite System, [1964] 15(2) U.S.T. 1705.

[3]*Id.*

above was avoided and a six-year transition scheme was worked out (as described more fully below).

The applicability of this type of phased-timing arrangement to other areas depends on many factors, such as the technology involved, the political situation, and the prior history of cooperation. For example, in the case of the international organization created to own and operate a communications satellite system to provide maritime services, the situation was quite different: more than a decade had passed in which the technology had matured and its application had been defined, and experience had been gained with the workability of institutional arrangements in the form of INTELSAT. Accordingly, there was not the same need to proceed more slowly with a phased transition into an international organization. In other activities which are yet to emerge, such as space platforms, the situation undoubtedly will be different, calling for different arrangements.

2. The Question of Combining Political and Technical Elements

There are many international cooperative activities in technical areas, such as health, aviation, food standards, communications, energy, etc. Much of the work at the national level in connection with these activities is done primarily by the technical government ministries and the departments concerned rather than by the foreign ministries. This work includes development of positions, representation at international meetings and subsequent implementation of the international standards, regulations or recommendations.

It is a fallacy to assume that in practice, governments are monoliths, speaking with one unified voice. Very often, the technical experts and representatives to international conferences may have more in common with each other than each may have with their respective foreign ministries. In view of the common technical background and education, shared professional concerns and goals are understandable and not at all undesirable. At the same time, however, coordination of the technical and political elements is obviously necessary at the national level as reflected in the various governmental ministries. The question then becomes how appropriately to combine both of these elements in an institutional framework concerned with international cooperative activities. INTELSAT provides one example of how this question has been answered.

INTELSAT is governed by two international agreements: the Agreement setting forth the basic provisions and principles and structure of the organization, signed by governments through their foreign ministries, and an Operating Agreement setting forth more detailed financial and technical provisions and signed by the governments or their designated telecommunications entities. In most cases these Signatories are the ministries of communications of the countries concerned, but in some cases they are quasi-public or private entities under varying degrees of governmental control or supervision. (The most prominant example in this respect is the Signatory representing the government of the United States in the Organization—the Communications Satellite Corporation, a private corporation established by federal legislation to represent the United States in the international arrangements for the global communications satellite system.)

INTELSAT's structure contains three representative organs which reflect this distinction between political and technical representation. First, the Assembly of Parties, which meets every two years, is composed of all States party to the Agreement, and is primarily concerned with "those aspects of INTELSAT which are primarily of interest to the Parties as sovereign States." Decisions are taken on a one-country, one-vote basis, and the principal representation is provided by the foreign ministries.

Second, the Meeting of Signatories, which meets annually, is composed of all the Signatories to the Operating Agreement, and is primarily concerned with financial, technical, and program matters of a general nature. It is empowered to take certain specified decisions of a general nature in these areas, such as raising the capital ceiling and establishing general principles for utilization charges. Decisions are taken on a one-country, one-vote basis, and representation is provided by the Signatories, for the most part, communications ministries; thus, it is more technically and operationally oriented than the Assembly of Parties.

Third, the Board of Governors, which meets at least four times a year, is the organ with the basic responsibility to take decisions covering the design, development, establishment, operation and maintenance of the space segment. It is composed of Governors representing Signatories with a certain minimum investment share, singly or in combination, and, with certain limitations, Governors representing at least five or more Signatories. Decisions are taken by weighted vote, each Governor casting a vote equivalent to his Signatory's investment share. The representatives of the Signatories to the Board of Governors are officials concerned, in their home countries, with the operation and management of the satellite system, and generally have a management, technical, or financial background. The Board, in turn, is assisted by several advisory committees covering technical, financial, and planning matters, and these groups are comprised of specialists from their respective Signatory organizations.

This arrangement works well in practice. Decisions are considered and taken by technically oriented representatives who will have the responsibility, within their home countries, for implementing these decisions (e.g., the construction of new earth stations), and who have a direct and practical common interest in the continued viability of the operational system. At the same time, recognizing that many decisions of a "technical" nature have interwoven political and foreign policy aspects, there is, of course, often consultation and coordination on particular issues by the Governors and representatives to the Meeting of Signatories with their respective foreign ministries.

The arrangement works because of the large degree of common interest among the member states and because the subject matter is not one in which controversial issues of a political nature predominate. Whether this type of arrangement would work as well in other areas would depend on such factors as the nature of the membership, the political issues involved, and the extent to which a shared common interest existed.

3. The Question of Management

The question here is management on an international level of an operational system. It is not a question of an international secretariat: almost all international organizations have such secretariats, but such organizations are primarily concerned with regulatory or coordinating functions. With the exception of the World Bank and its associated institutions, there are almost no intergovernmental organizations with a

direct operational responsibility. Thus, INTELSAT's experience as an international organization with the direct responsibility of owning and managing a global communications satellite system may be instructive and of some applicability in other situations.

As discussed earlier in connection with the question of timing, it is important to avoid an *either/or* dichotomy: either the international organization is entrusted with management functions at one time or not at all, and either it will be entrusted with all management functions or with none. As to both of these choices, the INTELSAT experience indicates that there are a wide range of alternatives which avoid this dichotomy. The issues are to what extent, how fast, and under what terms should effective management control be shifted from the national to the international level? These are, of course, as much policy issues as technical or management issues.

Various transition schemes are possible to time the introduction of international management arrangements. A principal feature of the permanent INTELSAT Agreements was the provision for a phased shift from national to international management over a seven-year period.

In the first phase, which extended from 1973, when the organization was first established, to the end of 1976, the international staff was headed by a Secretary General and a relatively small support staff. However, the technical and operational management of the system was entrusted to the Communications Satellite Corporation, which was the U.S. Signatory to the Operating Agreement and had served as Manager of the global system under the interim arrangements in force from 1964 to 1973. The INTELSAT Secretary General had no direct authority to supervise this contractor, which reported directly to the Board of Governors, but had a monitoring role to keep the Board informed about its activities.

The second phase, from 1976 to 1979, saw a further shift in the direction of international management. The Secretary General became the Director General with responsibility for all management services and for supervision of the performance of the management services contractor. While the monitoring and reporting relationships in this interim period were complex and would not have been devised by an efficiency expert, they did reflect the realities of the situation.

The third phase, which commenced in 1979, in a sense marked the end of the period of transition to international management. The management contract with a national entity had ended, but the Agreements provided some criteria to help determine whether all management functions would be conducted in-house or not. Article XI(c) (ii) provided:

> The Director General, on behalf of INTELSAT, shall contract out, to one or more competent entities, technical and operational functions to the maximum extent practicable with due regard to cost and consistent with competence, effectiveness and efficiency. Such entities may be of various nationalities or may be an international corporation owned and controlled by INTELSAT. Such contracts shall be negotiated, executed and administered by the Director General.

A significant portion of the functions previously contracted out were now assumed by the Organization itself, with a consequent major increase in staff, including the *en masse* transfer from the contractor of the technical personnel who had previously performed these functions. As part of this process, an expanded and revised organizational structure for the Executive Organ was also established.

In addition, in applying the criteria specified in the Agreement (and quoted above), INTELSAT concluded two technical services contracts with the same entity that had previously provided management services to provide assistance in certain defined areas for periods of six and four years. An additional contract was also concluded for specified laboratory services for a three-year period. These contracts differed from the preceding management service contracts essentially in that the scope and discretion of the contractor was greatly reduced and its role was confined to the performance of specified tasks.

As these contracts come up for review in the next few years, judgments will have to be made, in light of the above-quoted, mandated criteria, as to which specific functions should be brought in-house, which should continue to be contracted out, to whom, and under what arrangements.

Quite obviously, the management arrangements just described and their transitional aspects reflect a particular situation and cannot automatically be applied in other situations. For one thing, the international organization inherited an ongoing operational system which was already under the effective management of a national entity and upon which many countries relied for their telecommunications. Time was needed to build up an international staff and to gain the requisite experience in this highly specialized activity.

In other areas, where an international organization could be put in place *before* an operational system was established or complex activities were commenced, it might not be necessary to have so elaborate a transition scheme. Moreover, in certain areas, depending on the state of the technology and its distribution, the question of the extent to which certain technical and management functions should be contracted out to national or other international entities could be resolved differently. What seems clear, however, is that if there is to be a division of the activities in question between the international organization, on the one hand, and other entities, whether national or international, on the other hand, the key to success is close cooperation and effective working relationships, in view of the interrelated nature of these activities.

4. Finance and Control

The problems are: how is power and authority to be distributed among the member states of an international organization? What criteria should apply?

Since the financial contribution and status of the members are different, one cannot reasonably have a one-country, one-vote rule for those decisions having major financial consequences. (At the same time, one must recognize the basic principle of nondiscriminatory access by all members to the benefits and technology resulting from the Organization's activities.)

It is easier, of course, to state the problem than to devise a workable solution. As always, the particular solution will depend on the specific situation and context. But here again, INTELSAT's experience may be instructive.

INTELSAT's basic philosophy is that each member's financial interest in the Organization—its investment share—is strictly proportional to its use of the system, as determined on a annual basis. If member X's use of the system, as measured in revenues paid in a given year, is, let us say, 9%, then its investment share is 9%, and it is required to contribute 9% of the costs incurred by the Organization in carrying out its

activities. The corollary concept is that each member's vote in the Board of Governors, the key organ that takes the key decisions relating to the establishment of the system, including those having financial consequences, is based on its investment share. As a member's proportionate use of the system will fluctuate over the years, so its investment share in the Organization and its voting power on the Board will also fluctuate. (There are some exceptions to this basic principle, as applied to voting, to reflect the interests in representation on the Board of those countries with minimum financial status in the Organization, and in terms of the majorities necessary to adopt decisions.)

In practice, decisions are rarely taken on the basis of votes, but are normally arrived at by consensus after a process of consideration and consultation over a period of several meetings. This is especially true for significant decisions with major financial consequences.

5. Transfer of Technology

In the course of international cooperative work, particularly in high technology areas such as space activities, advanced technology in the form of information and data will be developed. The questions then are: how are the members of the Organization, which financed the activity that produced the technology able to share in its fruits? What rights should they have, what restrictions should be imposed, and how is the information to be transferred to them?

INTELSAT has had some fairly elaborate experience in this area. Under its interim arrangements, during the period 1964-1973, the basic principle was that INTELSAT itself would own the technical data and inventions that arose from work it financed, such as contracts for the manufacture of spacecraft and research and development contracts. In light of experience, this policy was changed in the permanent arrangements, which entered into force in 1973, so that INTELSAT obtained only a non-exclusive, royalty-free license to use the technology, with the developer retaining ownership rights.

Under both systems, an elaborate procedure was developed to identify the technical information and data and then to make arrangements for its transfer to those members wishing to utilize it and to safeguard, from a proprietary standpoint, INTELSAT's rights in such data. For example, determinations need to be made as to whether a particular invention should be the subject of a patent application, and if so, in which countries and which respective Signatories should be notified.

The arrangements, though complex, have worked reasonably well in practice in terms of an effective transfer of the technology to members wishing to utilize it. One area where practical solutions still need to be found is in the application of national laws concerning dissemination of data. The applicability of this type of arrangement to other areas would depend, among other factors, on the nature of the technology in question and the degree of its demand by member states. In INTELSAT's case, while INTELSAT's members benefited from the application of this technology to the global system, as a general matter, they did not have the capability or need to utilize it directly themselves, apart from the Organization. In other situations where such a widespread need might exist, the arrangements might well need to be different.

COMMERCIAL PARTICIPATION IN SPACE ACTIVITIES

*Martin Menter**

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

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

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

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

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[1]Pub. L. No. 87-624, 76 Stat. 419, 47 U.S.C. 701, et. seq. (1962).

[2]*Id.* § 301.

[3]*Id.* § 305(a) (1).

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

[5]See S. 212, 96th Cong., "The National Space and Aeronautical Policy Act of 1979"; S. 244, 96th Cong., "Space Flight Policy Act of 1979"; S. 663, 96th Cong., "Earth Data and Information Service Act of 1979"; S. 875, 96th Cong., "Earth Resources Information Corporation Act of 1979" and H. R. 2337, 96th Cong., "Space Industrialization Act of 1979."

[6]U.S. Civil Space Policy, *supra* note 4, at 561.

[7]White House Press Release, June 20, 1978, Presidential Directive on National Policy, republished in S. Doc. 95th Cong. "Space Law—Selected Basic Documents," *supra* note 4, at 559.

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

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

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

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

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

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

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

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

[11]Disher, "Space Transportation, Satellite Services and Space Platforms," 17 Astronautics and Aeronautics 42, 67 (1979).

> of setting up large, earth-like communities several hundred thousand miles up in space.[12]

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

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

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

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

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

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

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

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

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

adopted by the U.N. General Assembly[17] and reiterated in the 1967 Outer Space Treaty: "Outer space, including the moon and other celestial bodies, is not subject to national appropriation by claim of sovereignty, by means of use or occupation, or by any other means."[18]

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

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

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

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

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

[18]Outer Space Treaty, *supra* note 14, Art. II.

[19]S. Rep. 90th Cong., *supra* note 13, at 22.

[20]Outer Space Treaty, *supra* note 14, art. VI.

[21]*Id.* art. IX.

[22]*Id.* art. VII.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

[31]14 C.F.R. §1214, 45 Fed. Reg. 14845-14846 (1980).

[32]§ 203 (c), § 304 (a), 42 U.S.C. 2455 (a), 2473 (c).

[33]18 U.S.C. 799.

[34]Art. 2, U.C.M.J., 10 U.S.C. 802.

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

[36]*Id.* arts. 1-5.

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

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

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

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

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

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[38]48 U.S.C. 1681 (a) *and* 1681a.

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

> States Parties to this Agreement hereby undertake to establish an international regime, including appropriate procedures, to govern the exploitation of the natural resources of the moon as such exploitation is about to become feasible. This provision shall be implemented in accordance with Article 18 of this Agreement.[40]

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

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

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

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

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

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

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

The latter, reference in pertinent part, recites that

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

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

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

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

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

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

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

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

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

negotiated history will reveal. It was the United States in 1973, that proposed the insertion of the phrase in Article 11(3) of "or natural resources in place" before the words "shall not become the property of. . ." etc. The U.S. Representative at the 1973 Legal Subcommittee meeting explained that the intent of the words "in place" was "to indicate that the prohibition against assertion of property rights would not apply to natural resources once reduced to possession through exploitation either in the preregime period or, subject to the rules and procedure that a regime would constitute, following establishment of the regime."[44] The intent, being thus ascertained, governs and should resolve the issue.

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

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

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

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

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

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

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

[46]"U.S.S.R. Working Paper" U.N. Doc. A/C.105/101 (1973).

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

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[47]Moon Treaty, *supra* note 24, art. 11.

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

> The major merit of replacing the vague expression 'province of all mankind' by the more meaningful expression 'common heritage of all mankind' is that in so doing one has specified the commencement of an action, replacing an abstract statement by a means of operating, within a specified legal framework.
>
> The fact that General Assembly Resolution 2749 (XXV) on the seabed was adopted without any dissenting vote is definite proof of the existance of this legal viewpoint common to all States, entirely irrespective of their special internal features, their philosophical ideas or their policies.

[49]*Id.* at 15-16. Final consequences envisioned by the Moon Treaty were enunciated by Argentina as:

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

[50]Petree, *supra* note 45, at 5.

[51]*Id.* at 7. In reference to art. 11 para. 7(d), Petree stated:

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

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

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

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

[53]*Id.* at 99.

[54]Moon Treaty, *supra* note 24, art. 7(1).

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

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

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

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

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

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

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

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[57]U.N. Doc. 1979 COPUOS Comm. Report, *supra* note 45, par. 65, at 11. It may be recalled that a 1874-1975 National Academy of Sciences Study, "Environmental Impact of Stratospheric Flight," pointed out foreseeable adverse biological and possibly climatic effects of aircraft emissions in the stratosphere (N.A.S. Printing, 1975). The most clearly established problem was the potential reduction of ozone in the stratosphere, leading to an increase in biologically harmful ultraviolet light at ground level resulting in an increase in skin cancer. A recent study by the International Astronautical Federation recites that "A further consideration in the expanded use of new [space] transportation systems, whether or not they themselves are reusable, is the inevitable increase in quality of the propellant combustion products which are deposited in the various layers of the atmosphere. Such products, even the water vapor generated by the combustion of hydrogen and oxygen, clearly have global effects, and therefore the consequences of their deposition in the atmosphere should be considered by an international body." U.N. Doc. A/AC.105/244, Secretariat's Report—International Implications of new Space Transportation Systems 19 (August 16, 1979).

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

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

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

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

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[59]*Hearings on International Space Activities before the House, 1979, supra* note 45, at 96.

[60]*See* note 25 *supra.*

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

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

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

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

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

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

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

a. With regard to Article 11-

1) Paragraph 1. The term "common heritage of mankind" derives its meaning solely from its use in this Treaty. As such, it. . . (ect.)

2) Paragraph 3. The insertion of the phrase "or natural resources in place" is a limitation on the recited prohibition of ownership of portions of the surface of the moon; however, such ownership may obtain when the natural resources upon exploitation are no longer "in place."

3) Paragraph 4. Exploration and use of the moon without discrimination includes its exploitation. This interpretation is confirmed by the recital in last sentence of Article 6, paragraph 2.

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

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

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

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

THE SPACE SHUTTLE IN PERSPECTIVE +

*S. Neil Hosenball**

Brief Description of the Shuttle

The Space Shuttle flight system is composed of the Orbiter—an external tank and two solid rocket boosters. The Orbiter has a cargo bay in which the Spacelab or other payloads may be carried. The Shuttle may carry propulsion stages or upper stages, which may be used to take satellites from Earth orbit into either synchronous orbits, circular orbits, geostationary orbits or planetary trajectories to one of the outer planets or to the moon.

The Space Shuttle is a reusable launch vehicle. It can deploy satellites and undertake experiments; it can do on-orbit servicing and retrieve payloads. It is only an earth-orbiting vehicle. It can go from an orbit of about 100 nautical miles to about 600 nautical miles above the Earth. It cannot go further into outer space or deep space. It can be used either as a space laboratory with a Spacelab or for other types of experimentation, even without the Spacelab on board. It will be able to carry up to 65,000 lbs. in its 60 x 15 ft. cargo bay. Its use can substantially decrease the cost per flight. For instance, by the use of the Shuttle, the cost of a delta payload used for launching a communications satellite could be reduced to about half the cost.

With this truncated description of what the Shuttle is and what it can do, let me limit my perspective of the Space Shuttle to its commercial aspects.

Charges to Users

One of the concerns of the fairly large number of commercial users of communications satellites (RCA, AT&T, Western Union, INTELSAT) has been that they were charged actual costs. Consequently, they would sometimes receive a bill for additional costs, far exceeding the original estimate—either as a result of inflation, strikes, a lower than predicted launch rate or some other reason causing a price increase. Commercial users prefer to have a fixed price for obvious reasons; future planning and fixing their cost exposure being just two of many good reasons. The Space Shuttle is a considerable improvement on this situation, inasmuch as all standard launch services charges, with the exception of escalation due to inflation, are included in the fixed price. In addition, there is a re-flight guarantee to the effect that if a mission is aborted, it will be flown again for free. In other words, there will not be any charge for the second mission if the abort was not caused through fault of a commercial user. In case of an expendable launch vehicle, if there were a failure for any reason whatsoever, including NASA's fault, one had to buy a new launch.

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+ *Editor's note:* This article the text of which has recently appeared in "The Space Shuttle and the Law", edited by Professor Stephen Gorove is reproduced here with permission and exceptionally, for the reason that it formed an integral part of the Symposium on "Space Law in Perspective".

The user of the Shuttle may get 20% standby discount if the user is willing to go when he is told to go. This is similar to the practice of airlines giving discount on a standby basis. The user may also get discounts on charter flights when they buy the whole payload capacity. The share-user concept is quite evident with respect to the Shuttle.

Schedule of Launches and Reimbursement

Originally, when the Space Shuttle program was first suggested, nobody was concerned about NASA's meeting its schedule. Instead, the concern was whether there would be sufficient payloads to fully utilize the Shuttle's capabilities. It was thought that NASA would probably meet its schedule, just like it met its Apollo schedule. Now there is concern about the delay, since there would be considerable cost-saving for commercial operations, if the Shuttle were used instead of an expendable launch vehicle. It has been estimated that there will be sixteen launches in 1982, seven of which will be NASA launches, while the others will be U.S. commercial, foreign or military launches. In subsequent years, the number of commercial and foreign launches is expected to increase. A significant number of these launches will be reimbursed launches. At the current level of expendables, the U.S. is being reimbursed approximately two to three-hundred million dollars a year, for either vehicles or services that are being rendered for foreign government and U.S. commercial customers.

Kinds of Payload and their Selection

If there is some extra space onboard, some very small self-contained payloads, so-called getaway specials, may be thrown on for a cheap price. However, rather rigid rules apply as to what can be placed in them. Many universities have bought a small self-contained payload for experiments; several groups have bought some for high school students. The Shuttle will enable us to send up such payloads into space relatively cheaply and provide an opportunity to both non-profit and private enterprises to experiment at small cost. The Shuttle is not going to fly souvenirs, coins or things of a similar nature; it will be used for research and the development and manufacture of new products. All kinds of requests have been received. Some people wanted to fly cereal so that they could sell the cereal on the ground as "space" cereal. Not too long ago, a proposal was submitted from a funeral parlor which wanted to spread ashes in space. The request has been turned down. Initially, the Space Shuttle will be used as a research vehicle and to move space application research toward commercial application. But some of the more unusual proposals present some difficult questions. There was a request, for example, from a sculptor who wanted to send up a small package filled with water, which would then be injected into space to form an ice sculpture. In another instance, a musician wanted to go up and play in space to see if it can be done and what effect it might have. There are news broadcasters who want to be the first news broadcasters from space. There are movie producers who want to produce the first movie in space. The most difficult question is who and what should be selected. Some of these requests for the use of the Space Shuttle cannot be rejected lightly.

There has also been a great deal of discussion and research on building assemblies, space stations and space platforms in space. There has been a great deal of discussion

and research about constructing solar power stations in space, converting solar energy into electricity, transmitting it to Earth by microwave or laser and reconverting it on Earth into electricity.

NASA Authority

Insofar as the law is concerned, the most important task with respect to the Shuttle was to determine if there was anything that the Shuttle would do that would be in violation of existing domestic legislation or international treaties and if new domestic legislation was needed to carry out the Shuttle program. More specifically, it had to be determined what authority NASA had under the current Space Act[1] and other applicable statutes and what limitations, if any, might exist that would impact on Space Shuttle operations.

While NASA is a Government agency with a very broad and flexible statute that served us well for over 20 years, we are nonetheless a Government agency whose authority is both granted and limited by statute. NASA cannot, under existing law, run its operation like a commercial operation. NASA is not authorized by statute and recent court decisions to make profit on the services it sells; to set up the normal reserves or revolving funds that industry normally uses to take care of contingencies, risks and the like; or to issue bonds or stock to finance its activities.

For these reasons, NASA assumes no hard contractual obligations for the success or failure of a launch. If something goes wrong with the Shuttle and it has to be brought back or if something went wrong with a payload as a result of something that NASA had done, NASA has no contractual liability for loss or damage to the payload, for loss of revenue, or other consequential damages. There is no guarantee that everything that NASA does will be free of negligence. NASA will use its best efforts, but it does not take on a common carrier type of obligation.

Space Allocation

As to allocation of space on the Shuttle, NASA follows the principle of first-come-first-served. There would be a problem, if one were to auction off space on the Shuttle or allocate it by raising prices. NASA's launch policy, which has been in effect for some time, is based on the principle of nondiscrimination. NASA will not charge anyone more than it charges a domestic commercial concern. This is in line with the provision of the 1967 Outer Space Treaty[2] which states that access to space should be on a nondiscriminatory basis, and if one started auctioning off access to space, the rich nations could buy it and others could not. NASA did not want to decide priorities because if it decided that one commercial customer had priority over another commercial user, it would really have made an economic decision affecting the two entities. Thus, NASA decided that it would follow the first-come-first served principle and not intrude itself into these types of economic decisions. In this connection, the

[1]National Aeronautics and Space Act of 1958, As Amended, and Related Legislation, Pub. L. 85-568, 85th Cong. H.R. 12575 July 29, 1958, 72 Stat. 426, 42 U.S.C. § 2451.

[2][1967] 18 U.S.T. 2410, T.I.A.S. 6347, 610 U.N.T.S. 205 (effective Oct. 10, 1967).

suggestion was made to users that if they wished and if they could avoid antitrust implications, they should consider establishing a user's organization that could make decisions on launch priority.

Who Should Operate the Shuttle?

Last year, the National Academy of Engineering undertook a study to determine what sort of operation the Space Shuttle should be; whether it should be retained in government, in NASA or some other government agency—not necessarily NASA; whether it should be a public corporation following the COMSAT model; or whether it should be totally private enterprise, a stock company that would in effect operate the Space Transportation System for all users—government, foreign or private commercial entities. The Academy has not precluded any of these options. It has suggested that at least for now, the Shuttle ought to be a NASA operation.

Insofar as any restriction on a private company buying a Shuttle is concerned, the Outer Space Treaty of 1967[3] stipulates that all national activities shall be under the authorization and continuing supervision of the government. Thus, there must be a government authorization to launch the Shuttle because of the requirement in the Outer Space Treaty. In addition, there is the problem of financing. The Orbiter, once it goes into production, would cost about $100,000,000. In theory, however, there is nothing to prevent a private company from buying a Shuttle except the aforementioned considerations and the need to use existing NASA and Air Force facilities. I doubt these facilities would be turned over for the exclusive use of a private company without Congressional authorization.

Risk, Liability and Insurance

Turning to problems associated with risk, there is commercial insurance available to cover practically every risk in NASA's launch services contract. There is also a provision in the launch services agreement to the effect that the Government agrees not to hold any user liable for damage to the Orbiter and, in return, the user agrees not to hold any other user or the government liable for damage to his particular payload. Thus there are cross waivers in effect, covenants not to sue, as well as an indemnity if a user fails to flow down this provision to any party who could bring a separate action, including an action based on the right of subrogation. This has been done because of a concern about the capacity in the insurance market to insure such a risk. There was also a concern about the mixture of payloads and the differing value of payloads. For instance, a ten thousand dollar payload may explode, causing damage to a $300,000,000 payload. A university, research institute or small business ordinarily would not carry the kind of product or third-party liability insurance that would be needed and, therefore, could not afford to take the risk of flying on the Shuttle.

The past practice has been that commercial users have gone into the market and insured their satellite. They have insured their spacecraft against damage from any cause, based on its stated value (the cost of the spacecraft and associated launch). When COMSAT took out its first policy, the premium was about 14 percent; more recently the

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[3] *Id.*

premium has come down significantly to about 7 percent. When COMSAT attained its first policy, it had what is called a two-failure deductible; so before you could receive payment on the policy, you had to lose two satellites out of four. This went down to a one-failure deductible policy and then to no deductible at all.

In addition to covering damage to property, the market has been writing loss of revenue insurance, so-called satellite life insurance; so if the satellite stops operating before its anticipated five-year life and loses revenue, you get loss of revenue coverage. Mostly, Lloyds has been involved, but the market has become pretty much an international market with Lloyds participating. When the European Space Agency lost one of its satellites, insurance paid $34,000,000. A more recent loss of an RCA satellite, insured for $70,000,000 with Lloyds, has also been paid.

As to third-party liability insurance, there is a general government policy against the government's buying insurance covering third-party liability risk. Under Section 308a, a recent amendment to the NASA Act[4], NASA has the authority (1) to indemnify (which will take care of the "little" user) and (2) to buy insurance to the extent it is available and needed to protect itself and anybody else flying on the Shuttle. NASA is in the process of issuing regulations implementing this new legislation. In the meantime, NASA requires in its launch services contract with a commercial user or foreign government, that the user provide up to $500,000,000 worth of third-party insurance coverage, or such other amount that may be available, with the U.S. Government being a named insured as well as the particular user. NASA has recently participated in the negotiation of a policy in which the insured is Satellite Business Systems—a partnership of COMSAT, IBM and Aetna Insurance, the United States Government and those prime and subcontractors which the U.S. Government would be required to reimburse for third-party liability losses. There are many provisions in the policy which go beyond the normal commercial aspects of insurance. There is even a provision that any defense based on the sovereign immunity of the United States Government will not be asserted without the express consent of the Government. Thus, the Government could, in a particular situation, waive its sovereign immunity defense under the Federal Tort Claims Act[5]. It also provides for the payment of claims presented under the 1972 Liability Convention[6] and for the U.S. Government to negotiate and control, though in consultation with the underwriters, the settlement of claims.

Insurance availability, third-party liability, property damage or what is called first-party liability and loss of revenue coverage are very important aspects of the ever-expanding commercialization of space. If commercialization is to come about through investment by private enterprise, users will want to spread the risk of loss or liability for damage.

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[4]42 U.S.C. § 2458 (b).

[5]28 U.S.C. § 1346.

[6]Convention of International Liability for Damage Caused by Space Objects, March 29, 1972, [1973] 24 U.S.T. 2389, T.I.A.S. 7762 (effective Oct. 9, 1973).

New Business Opportunities and Joint Endeavors

Until very recently, all of our commercial users of launch services were the satellite communications companies. However, NASA is committed to involve other sectors of U.S. industry in space-based business opportunities as well.

If researchers in virtually every discipline of science and technology knew that within a hundred miles of their laboratories there existed a facility where they could achieve a near-perfect vacuum, zero gravity and an unlimited vantage point from which to view the Earth, we are convinced that they would jump at the chance to use the laboratory in a host of unique experiments—pharmaceuticals, materials processing, electronics, solid state physics, crystal growth, communications, lasers, biology, geological and geophysical exploration and so on. During the 1980's such a laboratory will be available to U.S. industry, only it will not be a hundred miles down the road; it will be a hundred miles overhead, in Earth orbit. That laboratory, of course, is the Space Shuttle and the European-developed Spacelab.

On June 25, 1979, NASA issued Guidelines Regarding Early Usage of Space for Industrial Purposes. Supplementing those broad guidelines, on August 14, 1979, NASA issued Specific Guidelines Regarding Joint Endeavors with U.S. Domestic Concerns in Materials Processing in Space[7]. And on January 25, 1980, NASA entered into the first such joint endeavor with the McDonnell Douglas Astronautics Company. That endeavor, which involves substantial investment by McDonnell Douglas and its associates, will utilize the unique capabilities of the Space Shuttle to develop and demonstrate the technology of continuous-flow electrophoresis under low gravity conditions. NASA will provide free flight time on the Space Shuttle in return for McDonnell Douglas and its associates agreeing at their expense to conduct a three-phase sequential program involving (1) feasibility studies, planning and ground research and development; (2) flight experimentation and technology development; and (3) applications demonstrations in space. In return for McDonnell Douglas promising to make the results of the endeavor available to the United States public on reasonable terms and conditions, NASA agrees to refrain from entering into a similar joint endeavor or international cooperative agreement directly related to the development of commercial devices and processes which would compete with those expected to result from the McDonnell Douglas effort. NASA is not precluded from selling flight time on the Shuttle to any other organization wanting to conduct the same or similar experiments, but it is precluded from providing free flight time for such experiments. Significantly, NASA will not acquire rights in inventions which may be made by McDonnell Douglas or its associates in the course of the joint endeavor, unless McDonnell Douglas fails to exploit the inventions or terminates the agreement or the NASA Administrator determines that an emergency situation exists. At least two additional proposals for joint endeavors with NASA are now being actively considered.

Conclusion

Insurance to reduce the risk, incentives that NASA is willing to make available to U.S. industry, and the demonstrated willingness of industry and the financial

[7] 44 Fed. Reg. 47, 650 (1979).

community to invest their funds in space ventures make it clear to me that the new Shuttle capabilities will exponentially increase commercial activities in space during the decade of the eighties. With the year 2000 only 20 years away, the next century may very well see large numbers of people working and living in space, producing new and improved products for those who have to remain here on Earth.

THE AMERICAN BAR ASSOCIATION AND THE 1979 MOON TREATY: THE SEARCH FOR A POSITION

*Carl Q. Christol**

1. Introduction

Professional interest, as reflected in reports produced by concerned sections of the American Bar Association, has been directed toward the UN-sponsored Agreement Governing the Activities of States on the Moon and Other Celestial Bodies of December 5, 1979.[1] The Agreement, generally referred to as the Moon Treaty, is the fifth international space law agreement that has resulted from the rigorous, consensus-based, negotiating process of the UN's Committee on the Peaceful Uses of Outer Space (COPUOS). The first four have entered into force. The United States is a party to each of them.

The Moon Treaty will enter into force following the deposit with the Secretary-General of the United Nations of five ratifications. At the time of this writing the agreement has been signed by Austria, Chile, France, Guatemala, Morocco, The Philippines, and Romania.

The worth of the agreement, which had resulted from a careful assessment at the UN lasting from 1970 down to 1979, and which was considered sufficient to merit the unanimous approval of the General Assembly, has come under scrutiny in the United States. Attracting major attention was the establishment of the principle of the Common Heritage of Mankind (CHM) as a new substantive area of international space law. Thus, Article 11, par. 1 of the agreement provided that "The Moon and its natural resources are the common heritage of mankind, which finds its expression in the provisions of the Agreement and in particular in paragraph 5 of this article."[2]

In the process of writing the Moon Treaty the negotiators recognized that they were introducing a new principle into international space law. Thus, without defining the principle, as it applied to the Moon and to other celestial bodies, and to their natural resources, the agreement identified the substantive elements of the principle. This was done by way of enumerating the purposes to be achieved at a future and unspecified date by a new international legal regime, including appropriate procedures. The formation of the new regime and of the accompanying institutional processes was made dependent on the fact that the exploitation of the foregoing resources was about to

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[1]U.N. Doc. A/34/664, 12 Nov. 1979; 18 *ILM* 1434 (Nov. 1979).

[2]*Ibid.* The negotiating history of this provision, including wide-ranging alternative proposals, and an assessment of its meaning is contained in my "The Common Heritage of Mankind Provision in the 1979 Agreement Governing the Activities of States on the Moon and Other Celestial Bodies," 13 *The Int'l L.* 429 (1980).

become feasible.[3] Thus, Article 11, par. 7 of the agreement indicated that, pursuant to the CHM principle, emphasis was to be placed on the resources of the area. Specifically, the natural resources were to be developed in an orderly and safe manner. The resources were to be managed rationally. Opportunities were to be expanded for the use of the resources. It was also stipulated in par. 7 (d) that one of the main purposes of the regime and procedures was to secure "An equitable sharing by all States Parties in the benefits derived from those resources, whereby the interests and needs of the developing countries, as well as the efforts of those countries which have contributed either directly or indirectly to the exploration of the Moon, shall be given special consideration."[4]

Article 11 was consistent with the terms of Article 1 of the 1967 Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, Including the Moon and Other Celestial Bodies.[5] That Article, dealing only with the specified areas, and not with their natural resources, provided for the free and equal exploration, use, and exploitation of the given areas. It also provided for free access to all areas of celestial bodies, including the Moon.

As a result of the terms of the foregoing international agreements and their negotiating histories, it has been suggested that the CHM principle is based on the following considerations, and that they will have to be taken into account in its specific implementation. These include (1) the areas, following the *res communis* doctrine applicable to the high seas, are not the subject of appropriation; (2) a system of management is to be installed which would be concerned for environmental protections, for the needs of future generations, and for a sharing of benefits pursuant to the formula of equitability stated in par. 7 (d); (3) the area and its natural resources are to be used for peaceful purposes; and, (4) since, the area and its resources are to be subject to free and equal exploration, use, and exploitation, property rights are not to apply to the area and are to apply only to resources removed from their original "in place" location. This follows the provision of Article 11, par. 3 of the Moon Treaty, which states "Neither the surface nor the subsurface of the Moon, nor any part thereof or natural resources *in place,* shall become the property of any State, international intergovernmental or non-governmental organization, national organization or non-governmental entity or of any natural person."[6] In sum, the CHM provisions of the Moon Treaty are to be implemented through the formation of a future international legal regime pursuant to the foregoing sharing formula so that benefits derived from the resources will go both to States possessing the capabilities of exploitation and also to other States. Until such a regime and the attendant appropriate procedures have been brought into being the traditional *res communis* principle will continue to be operative. The analogy of the freedom of the high seas will apply.

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[3]Christol, "An International Regime, Including Appropriate Procedures, for the Moon: Article 11, Paragraph 5 of the 1979 Moon Treaty," in *Proceedings of the 23rd Colloquium on the Law of Outer Space* 139 (1981).

[4]*Supra* note 1.

[5]18 UST 2410; TIAS 6347; 610 UNTS 205. The Treaty entered into force for the United States on October 10, 1967. It is now binding on about 80 States.

[6]*Supra* note 1.

Following the approval of the agreement by the General Assembly in 1979, a number of assertions were put forward as to its meaning and operational effect. Among these were: (1) that the Treaty contained a moratorium provision that would prevent the exploitation of the Moon and celestial body resources pending the negotiation of the CHM regime; (2) that the agreement contained provisions that would prevent the free-enterprise system from engaging in exploitative activities; (3) that the agreement—as a consequence of a commonality of voting outlooks on the part of the Socialist States and the developing countries—served only the interests of such States; and, (4) that the agreement had departed from the central mandate of the 1967 Principles Treaty, with the result being that States could establish sovereign rights in the areas and resources of the space environment, e.g., outer space, per se, the moon, and other celestial bodies. Concerns such as these, among others, have resulted in academic, political, and professional assessments of the terms and objectives of the proposed treaty. Important studies have been published by the Senate Committee on Commerce, Science, and Transportation.[7] The same committee's Subcommittee on Science, Technology, and Space conducted detailed hearings on the proposed treaty.[8]

Two sections of the American Bar Association, namely the Section of International Law through its Committee on Aerospace Law, and the Section of Natural Resources Law reviewed the proposed agreement in 1980. On April 18, 1980 the Section of International Law affirmatively recommended to the House of Delegates of the American Bar Association that the U.S. Senate be urged to give its advice and consent to the ratification of the agreement subject to four understandings and declarations in the instrument of ratification. In addition to its recommendation the Section of International Law submitted a detailed report in which it analyzed the purposes and provisions of the agreement. The Section affirmed its belief that "the understandings and declarations suggested . . . should help guide and protect the position of the United States in any future negotiation of an international resources regime, and should allay concerns that the United States is directly or indirectly restricting its right to engage in or authorize the use of the natural resources of the Moon, including their commercial or other exploitation."[9]

2. *The Initiative of the ABA Section of International Law*

The Section of International Law took into account the then existing international law of outer space when it put forward its proposed understandings and declarations. In the first of these the Section called attention to the terms of Articles 1 and 6 of the 1967 Principles Treaty which enable both governmental and non-governmental entities to engage in the free and equal exploration, use, and exploitation of outer space, the

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[7]Senate Committee on Commerce, Science, and Transportation, Agreement Governing the Activities of States on the Moon and Other Celestial Bodies, Parts 1 through 4, 96th Congress, 2nd Session, (1980).

[8]The Moon Treaty, Hearings before the Subcommittee on Science, Technology, and Space of the Senate Committee on Commerce, Science, and Transportation, Serial No. 96-115, 96th Congress, 2nd Session, (1980); cited hereafter as *The Moon Treaty*.

[9]Section of International Law, American Bar Association, Report to the House of Delegates 10 (1980), reprinted in *The Moon Treaty*, *supra*, note 8 at 76-81.

Moon, and other celestial bodies. The first understanding also stated in modified form the understanding attached by the U.S. Senate in 1967 to Article 1 of the Principles Treaty. The Senate had indicated that "Nothing in Article 1, paragraph 1 of the Treaty diminishes or alters the right of the United States to determine how it shares the benefits and results of its space activities."[10] This was converted by the Section in 1980 to read that "It is the understanding of the United States that nothing in this Agreement in any way diminishes or alters the right of the United States to determine how it shares the benefits derived from exploitation by or under the authority of the United States of natural resources of the Moon or other celestial bodies."[11] This proposal was relevant to the proposed Moon Treaty, since it had made reference to benefits derived from natural resources. It was particularly germane since the 1967 Principles Treaty had not made specific reference to natural resources.

In the second of the Section's understandings, specific reference was made to property rights in such natural resources as had been taken into possession. It stipulated that they are "subject to the exclusive control of, and may be considered as the property of, the State Party or other entity responsible for their extraction, removal or utilization."[12] This was designed to focus attention on the right to establish property rights in the resources removed from their "in place" locations. This right had been established in Article 11, par. 3 of the agreement. This paragraph constituted a disavowal of efforts by the Soviet Union during the negotiations to avoid the establishment of property rights in certain aspects of the Moon and its natural resources. The proposed understanding captured both the terms of the agreement and the sense of the negotiating history.[13] The understanding was directed at allaying the concerns that had emerged from allegations concerning restrictions on free-enterprise opportunities in Moon and celestial body activity.

The third Section understanding dealt specifically with the CHM provision of Article 11 of the Treaty. Paragraph 1 provided that "The Moon and its natural resources are the common heritage of mankind, which finds its expression in the provisions of this Agreement and in particular in paragraph 5 of this article."[14] This had been introduced both to establish the principle and also to limit the CHM principle to the Moon and other celestial bodies. Thus, this CHM principle was not to be confused with the law of the Sea negotiations, which in Article 136 of the August 27, 1980 Draft Convention on the Law of the Sea (Informal Text), as well as prior drafts, had made references to a common heritage of mankind principle.[15] Thus, the International Law Section explicitly indicated that the Moon Treaty's reference to the CHM was to be based on the

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[10]Treaty on Outer Space, Executive Rep. No. 8 to Accompany Senate Ex. D., 90th Congress, 1st Session 4 (1967).

[11]*Supra* note 9, at 2.

[12]*Ibid.*

[13]Christol, *supra*, note 2, at 470.

[14]*Supra* note 1.

[15]U.N. Doc. A/CONF.62/WP.10/Rev. 3 (27 August 1980).

provisions of the Moon Treaty "and not on the use or interpretation of that term in any other context."[16]

The Section, in order to prevent charges that the terms of the Moon Treaty might be in conflict with Articles 1 and 2 of the 1967 Principles Treaty, stated that recognition of the CHM principle also constituted recognition "(i) that all States have equal rights to explore and use the Moon and its natural resources, and (ii) that no State or other entity has an exclusive right of ownership, property or appropriation over the Moon, over any area of the surface or subsurface of the Moon, or over its natural resources in place."[17] In this understanding the Section also took account of the provisions of Articles 12 and 15 of the Treaty. Following the language of these Articles, and in keeping with the documented, negotiating history of the treaty, the Section made it a matter of record that these provisions meant that parties "retain exclusive jurisdiction and control over their facilities, stations and installations on the Moon, and that other States Parties are obligated to avoid interference with normal operations of such facilities."[18]

The extent to which the Section considered it necessary to formulate the foregoing understanding was indicative of its concern with certain observations that had been circulated respecting the operation of the free-enterprise system in the exploitation of natural resources. Since the intent and purpose of the Moon Treaty demonstrably was written in such a manner as to allow for the application of the free-enterprise system by private entrepreneurs, this understanding was based upon a superabundance of caution on the part of the Section.

In its final understanding the International Law Section placed emphasis on the future exploitation of the natural resources of the Moon and other celestial bodies. In this understanding the Section endeavored to make it clear that the proposed treaty was dealing with two time periods. The first, or pre-Article 11, par. 5 time period, would allow for the application of the *res communis* principle to the exploitation of the natural resources of the Moon. Pending the establishment of such new legal regime, with its new appropriate procedures, the Section made it clear that until the indicated eventualities had come about that there would be no prejudice to "the existing right of the United States to exploit or authorize the exploitation of those natural resources."[19] In this connection the Section made specific the previously well-established fact that "No moratorium on such exploitation is intended or required by this Agreement."[20] The Section also considered it appropriate to specify that, while the conduct of the United States would have to be compatible with the terms of Article 6, par. 2 and Article 11, par. 7, that the United States should reserve "to itself the right and authority

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[16]*Supra* note 9, at 2.

[17]*Ibid.*

[18]*Ibid.*

[19]*Ibid.*

[20]*Ibid.*

to determine the standards for such compatibility unless and until the United States becomes a party to a future resources exploitation regime."[21]

The second time period related to the negotiation of the regime rather than to the fact of exploitation pending its creation. In this the Section agreed upon an explicit caveat that had been well documented during the negotiating history of the proposed treaty. The caveat stated that, in accepting the obligation to engage in good faith negotiations for a future regime, the United States was not agreeing to "any particular provisions which may be included in such a regime; nor does it constitute an obligation to become a Party to such a regime regardless of its contents."[22] Although it would appear to be self-evident that the United States would possess such an option even in the absense of the proposed understanding, the fact that it was put forward was some evidence of the manifest concern that criticisms of the treaty-making process might have gained some support.

Nonetheless, in the minds of some observers the use of well-intentioned and well-considered understandings and declarations contained some risks. Even where the process is legitimately employed, it invites other States to file their own special interpretations. This can produce a splintering effect with a resultant loss of the general agreement evidenced in the terms of the agreement and in its negotiating history.

3. The Concerns of the Section of Natural Resources Law

In this case the position taken by the Section of International Law undoubtedly served a useful purpose. A record was made, which was to be examined critically by the Section of Natural Resources Law. That Section, which has long been identified with a concern for the exploitation of minerals, including the manganese nodules located on the deep seabed and ocean floor, prepared a report, with recommendations, for the House of Delegates of the American Bar Association.[23] In the view of the Natural Resources Section the Common Heritage of Mankind principle, as set forth in Article 136 of the 1980 Draft Convention on the Law of the Sea (Informal Text) and in other provisions of that Text designed to secure the implementation of the principle, would be prejudicial to U.S. mining interests and to the general well-being of the United States.

The Natural Resources Section suggested three risks in accepting the Moon Treaty. First, it was urged that the acceptance of the CHM principle would prejudice the negotiations for a Law of the Sea convention as well as Antarctica. Second, it was argued that acceptance would create substantially increased pressures on the United States "to accept a 'celestial bodies' international regime which would control U.S. space investigations."[24] Thirdly, it was contended that it was readily foreseeable that a claim

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[21]*Ibid.*

[22]*Ibid.*

[23]Report of the Section of Natural Resources With Recommendation to The American Bar Association House of Delegates, in *The Moon Treaty, supra,* note 8, at 82.

[24]*Id.* at 85.

would arise to the effect that "a moratorium on exploration and exploitation of space resources is inherent in the Moon Treaty, pending establishment of machinery to govern such activities under the control of the international regime."[25] Thus, the Section urged that any decision on the Moon Treaty should be delayed because of the risks involved.[26]

4. The 1981 Joint Recommendation of the Two Sections

The views of the two Sections, while not consistent, proved to be reconcilable. In May 1981, following consultations, the Section of International Law, under the chairmanship of Mr. L. L. Brinsmade, and the Section of Natural Resources Law, under the chairmanship of Mr. J. C. Muys, issued a joint recommendation. The two Sections recommended that the ABA House of Delegates adopt a resolution favoring the signature and ratification of the Moon Treaty.[27]

In arriving at their joint recommendation the two Sections had been able to consider highly relevant materials gathered by the Senate Committee on Commerce, Science, and Transportation and the Hearings conducted by the latter's Subcommittee on Science, Technology, and Space.[28] The efforts of the two Sections were eased by focusing on the exploitation of the natural resources of the Moon and other celestial bodies. Section representatives accepted the fact that the CHM principle of the Moon Treaty was to be applicable to the Moon and to its natural resources. In this context the principle was to be separated from that contained in the current Draft Convention on the Law of the Sea (Informal Text). Further, the representatives were in agreement that the issue was sufficiently important for the United States to assert its views as to the ultimate meaning of the agreement, rather than being reactive to such interpretations as might be forthcoming from other States. Thus, certain policy statements were set forth in the preambulatory portion of the joint recommendation.

In an exemplary way the recommendation associated the peaceful uses of the entire space environment with the rule of law and with the national interest of the United States. It accepted the fact that existing international space law authorizes the exploration, use, and exploitation of the space environment. Operating on that correct premise, it was concluded that the United States, and presumably other States equally bound by presently existing international law, possessed "the unilateral right to undertake both scientific exploration and commercial development and use of natural resources found in outer space."[29] The recommendation also took account of the

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[25]*Ibid.*

[26]See, for example, the testimony of L.S. Ratiner and Congressman J. Breaux, in *International Space Activities,* 1979, Hearings before the Subcommittee on Space Science and Applications of the House Committee on Science and Technology, 96th Congress, 1st Session 109 and 142 (1979); See also the testimony of L.S. Ratiner and M.A. Dubs, in *The Moon Treaty, supra* note 8, at 105 and 139.

[27]American Bar Association, Report to the House of Delegates 1 (1981), See Appendix. Following their agreement the two sections referred their recommendation and the attached report to other relevant Sections so that the matter might come before the House of Delegates in August, 1981.

[28]*Supra* notes 7 and 8.

[29]*Supra* note 27, at 1.

legitimate interests of the United States and other members of the world community in the space environment. Included in this ennumeration were voluntary international cooperation, arms control constraints on the use of the space environment consistent with the security of the United States, protection of the natural environment of the area, and the safeguarding of the life and health of persons located in the area.

In order to protect the national interests of the United States, it was recommended that the ratification of the proposed treaty should include express declarations consistent with six principles. When compared with the four principles put forward in 1980 by the Section of International Law as understandings and declarations, it is clear that the 1981 recommendation is in many critical respects the same as the previous one of that Section. The six principles, namely (a) through (f), were arrived at through separating the Section of International Law's first recommendation of 1980 into two parts and the fourth recommendation of 1980 into two parts.

Aside from form the 1981 statement made some modest drafting changes, such as substituting for the term "understanding" in 1980 for the expression "position" in 1981. The 1981 statement in principle (a) substituted the expression "develop and use" for "develop and exploit" as these terms applied to commercial or other purposes. However, the 1981 statement added to the foregoing "and no constraint is accepted by this ratification" to the existing rights of exploration, development, and utilization of Moon and celestial body resources for commercial or other purposes.[30]

Principle (b) of 1981 retained the language of the second sentence of the first understanding of 1980, except that it adopted the expression "existing right" of the United States "to determine unilaterally how it shares the benefits derived from development and use by or under the authority of the United States of natural resources of the Moon or other celestial bodies."[31] Thus, the 1981 version used "development and use" rather than "exploitation."[32]

Principle (c) of 1981 followed the thesis ennunciated in the second understanding of 1980. However, the 1981 version strengthened the preceeding formulation. It made reference to natural resources "extracted or used" by a party to the agreement in lieu of "resources extracted, removed or actually utilized." The 1981 version stated that such resources "are subject to the exclusive control of, and shall be the property of the State Party or other authorized entity responsible for their extraction or use."[33] This replaced the 1980 clause reading "are subject to the exclusive control of, and may be considered as the property of, the State Party or other entity responsible for their extraction, removal or utilization."[34]

Principle (c) of 1981 also contained the sentence reading: "In this context, it is the position of the United States that Articles XII and XV of this Agreement preserve the

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[30]*Supra* note 27, at 2.

[31]*Ibid.*

[32]*Ibid.*

[33]*Ibid.*

[34]*Supra* note 9, at 2.

existing right of States Parties to retain exclusive jurisdiction and control over their facilities, stations and installations on the Moon and other celestial bodies, and that other States Parties are obligated to avoid interference with normal operations of such facilities."[35] This was a modest revision of the third sentence in the third understanding of 1980. The principal differences were that the 1981 joint recommendation indicated that its terms were to be treated as "the position of the United States."[36] This replaced the expression that "the United States notes that."[37] The 1981 statement made reference to the preservation of "the existing right" of the United States. This language had not been used in 1980, although both versions had made reference to Articles 12 and 15 of the treaty.

Principle (d) of 1981, like understanding 3 of 1980, took into account the CHM principle. Substantial changes were made in 1981. The 1981 version did not repeat the 1980 declaration that "the meaning of the term 'common heritage of mankind' is to be based on the provisions of this Agreement, and not on the use or interpretation of that term in any other context."[38] Thus, the non-reference in 1981 to the exact terms of the agreement can be explained as avoiding the obvious.

Principle (d) of 1981 has advanced a new and very restrictive view as to the substantive content of the CHM principle. Undoubtedly this new approach will add complications to an already complex situation. This can be best portrayed by reciting the terms of the 1980 understanding. In 1980 the Section of International law suggested as an understanding that "Recognition by the United States that the Moon and its natural resources are the common heritage of all mankind constitutes recognition (i) that all States have equal rights to explore and use the Moon and its natural resources, and (ii) that no State or other entity has an exclusive right of ownership, property or appropriation over the Moon, over any area of the surface or subsurface of the Moon, or over its natural resources in place."[39] This language, which was consistent with the provisions of the Moon Treaty and with its negotiating history, called attention to some of the consequences of the CHM principle. The proposed understanding of the Section of International Law signaled the foregoing characteristics of the principle as subjects of special recognition, but did not endeavor to restrict the CHM principle only to the identified characteristics.

The 1981 proposed principles of the two sections drastically modified the original approach of the Section of International Law. The joint statement accepted the previously identified substantive aspects of the CHM principle, but suggested that recognition by the United States that the Moon and its natural resources are the CHM would be "limited" to the specified illustrations.[40] Further, the joint statement rejected

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[35]*Supra* note 27, at 2.

[36]*Ibid.*

[37]*Supra* note 9, at 2.

[38]*Ibid.*

[39]*Ibid.*

[40]*Supra* note 27, at 2.

the reference made by the Section of International Law to "in place" natural resources. The joint statement substituted for the "in place" qualification of natural resources the following: "natural resources which have not been, or are not actually in the process of being, extracted or used by actual development activities on the Moon."[41]

The proposed principle (d) was a major departure from the terms of Article 11 of the Moon Treaty. In rejecting the "in place" terminology of Article 11, par. 3 the proposed principle would not only repudiate a major contribution made by the United States in the drafting of the treaty. It would also introduce terminology, namely, "natural resources which have not been, or are not actually in the process of being, extracted or used by actual development activities on the Moon,"[42] which possesses no known pedigree and undoubtedly would offer no guidance to whatever goals were intended to be served by such language. Although the joint statement contains a section entitled "Report," which deals with the indicated principles, the report offers no explanation or interpretation of the quoted language. Presumably the foregoing language was introduced because, according to the joint statement, "the negotiating record shows that some countries take the term 'common heritage' to mean that they have some form of right to control or extract benefits from the activities of countries which do undertake the burdens and risks of the exploration and use of outer space."[43] Apparently operating on this premise, the joint statement called attention to the possible impact of such expectations on the early exploitative activities of those States possessing such capabilities.

This outlook appears to have been based on a fundamental misunderstanding of the terms of the Moon Treaty and the record made during its negotiation. Factually it is clear that at the present time the international legal regime for such natural resources is one of *res communis.* This means that there is no present limitation on the free and equal explanation, use, and exploration, of such resources. Only at a future date when it has been demonstrated that there are valid prospects for large-scale exploitation will it be necessary to proceed, according to Article 11, par. 5 of the agreement, to put into place the international legal regime that would secure the practical implementation of the CHM principle. In arriving at such a legal regime, and in putting the CHM principle into effect, it will be necessary to achieve the goal, among others specified in Article 11, par. 7 of "an equitable sharing by all States Parties in the benefits derived from those resources, whereby the interests and needs of the developing countries, as well as the efforts of those countries which have contributed either directly or indirectly to the exploration of the Moon, shall be given special consideration."[44] This heavily bargained provision contains the specific formula for the future sharing of benefits on an equitable, not equal, basis.[45] The presence of this formula will impose well-understood

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[41]*Ibid.*

[42]*Ibid.*

[43]*Id.* at 5.

[44]Article 11, par. 7 (d) of the Moon Treaty, *Supra,* note 1.

[45]C. Q. Christol, *supra,* note 2, at 473.

limitations on claims which might possibly be put forward by non-resource States having an interest in either controlling or extracting benefits from the operational achievements of countries such as the United States. It also appeared from the language of the Report of the two Sections that a concern continued whether the specific language of Article 11, par. 1 of the agreement had conclusively established a distinction between CHM regimes for the space environment and for the ocean. This lingering doubt is regrettable, since Article 11, par. 1 in clear and uncertain terms, as reflected by overwhelming evidence during the recorded negotiations, separated the CHM principles applicable to the Moon and its natural resources from those of the ocean. Further, the joint statement expressed concern over the possibility of confusing the "implementation procedures" of the two agreements.[46] Again, this observation does not accurately reflect the fact that the 1980 Draft Convention on the Law of the Sea (Informal Text) makes detailed references to such procedures, whereas the Moon Treaty merely prescribes that at some future date a conference may be assembled to spell out the appropriate legal regime and appropriate procedures.[47]

Principle (e) of the joint recommendation borrowed heavily on the fourth understanding of the Section of International Law. Both stressed that no moratorium was intended or required by the agreement. The International Law Section applied this to "exploitation," while the joint recommendation stated that there should be no moratorium "on the commercial or other exploration, development and use of the natural resources of the Moon or other celestial body."[48] The joint statement concentrated more heavily on the development and use of the natural resources of the Moon and other celestial bodies than had the International Law Section. The joint statement, consistently with the International Law Section's 1980 understanding, acknowledged the duty of parties to act in a manner compatible with Articles 6 (2) and 11(7). The joint statement followed the understanding of the International Law Section in prescribing compatible conduct. It now reads: "However, the United States reserves to itself the right and authority to determine the standards for such compatibility unless and until the United States becomes a party to a future resources regime."[49] The acceptance of the terms of Article 11, par. 7 in the foregoing principle will necessitate a further clarification of the joint statement. The apparently unqualified acceptance of all of the CHM criteria identified in that paragraph will have to be examined for consistency in the light of the limited recognition set out in principle (d) as mentioned above.

The final joint principle (f) restated in a slightly more restrictive fashion the 1980 understanding put forward by the Section of International Law. As agreed to in 1981, the principle reads: "Acceptance by the United States of the obligation to join in good faith negotiation for creation of a future resources regime in no way constitutes acceptance of any particular provisions or proposed provisions which may be included in

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[46]*Supra* note 27, at 6.

[47]*Supra* note 3, at 139.

[48]*Supra* note 27, at 3.

[49]*Supra* note 27, at 3.

an agreement creating and controlling such a regime; nor does it constitute any obligation or commitment to become a Party to such a regime regardless of the contents of any such agreement."[50]

The Section of International Law had called for an "exploitation" regime. It had not made reference to "proposed provisions." The final principle by referring to a "future resources regime" identified the fact that the significant debate over the terms of the proposed treaty had related to the use of natural resources. Thus, the joint report of the two sections had focused on the issues raised by the provisions of the agreement dealing with that subject.

5. Conclusion

In appraising the product of the joint statement it is evident that both broad and specific considerations must be weighed. At the present time in the United States, as well as in some other countries, there is an increasing tendency to attach reservations or understandings to proposed international agreements. This tendency weakens the international legislative process in the sense that the end product is not allowed to become a consistent and coherent whole. Special interests that have not been able to prevail at the international bargaining table seek to advance their self-serving interests in the legislative halls of nations. Such understandings may produce a victory for manipulative skills rather than for the national interest. The adoption of understandings may be precedent setting. Many States may wish to reserve certain determinations to their unilateral judgments. In highly complex international agreements the prospects for reservations, particularly when identified with influential, single-issue constituencies, may result in an almost unfathomable network of international agreements. Thus, in principle, from the strategic and political approach to general international order, it is desirable to keep special reservations, interpretations, and understandings to a minimum.

From the legal point of view it is well recognized that if a State files an "understanding," when it ratifies an international agreement, that this constitutes an interpretation of treaty terms. A "declaration" constitutes a national statement of policy. When such qualifications relate to the international application of the agreement, such formal statements become binding in international law between the United States and those States which either accept or do not object to the indicated national position. This has been applied to the proposed Moon Treaty, as follows: "So, for example, any U.S. understandings on the meaning of 'common heritage,' 'equitable sharing,' 'in place,' the existence (or not) of a moratorium, or any other subject related to the international application of the Moon Treaty, will be legally binding as between the United States and parties who accept such understandings or who do not object with a stated intention of preventing the treaty relationship with the United States from entering into force."[51]

In the light of the legal consequences flowing from declarations and understandings attached by States to international agreements, it is clear that their

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[50] *Ibid.*

[51] A. W. Rovine, Letter to R. Stowe, in *The Moon Treaty*, *supra* note 8, at 82.

terms should both serve the national interest and be at least as clearly drafted as the terms of the basic international agreement to which they are to be appended. To the extent that the separate proposals of the Section of International Law and the Section of Natural Resources Law and the joint proposal of the two Sections merely reconfirm the express terms of the Moon Treaty, or can be legitimately supported from the negotiating history of the agreement, these proposals are acceptable. They may be redundant, but in the interest of abundant caution, they are not objectionable. However, the terms of the proposed principle (d) of the May 1981 Recommendation of the two Sections to the House of Delegates constitutes, in its efforts to give to the CHM principle a limited meaning, a rewriting of the terms of Article 11 of the 1979 treaty. The Report of the two Sections does not provide a satisfactory explanation for endeavoring to effect this major change. It did not provide a substantive assessment of the meaning to be attributed to its terms.

It has not been demonstrated that the national interest of the United States would be served by the proposed principle. The principle contains ambiguities. No reference point was provided whereby the meaning of the terms nor the special interests sought to be served could be validated. Further, it was inconsistent with the terms of the principle (e), which accepted the fact that signatories will be obligated to conform their conduct to the terms of the agreement, and in particular to the critical terms of Article 11, par. 7. Finally, from the perspective both of the development of the rule of law in international relations and of the legitimate interests of the United States, a considerable amount of caution is required in the formulation and use of understandings and declarations to international agreements. Perhaps the Association's House of Delegates will be able to obtain a clarification of the joint recommendation received by it from the two Sections, and in particular the meaning to be attributed to proposed principle (d). In any event it is to be expected that the members of the Senate Committee on Foreign Relations will take into due account any communication it may receive from the American Bar Association on the subject.

Although this analysis of the joint efforts of the two Sections to advance the national interest, as perceived by their various constituencies, has raised some questions concerning the validity of the indicated perceptions, one fact remains. The two Sections, subject to their respective outlooks, now support the signature of the Moon Treaty and its ultimate ratification. Unless the United States becomes a party to the agreement, it will not be a participant in the negotiation of the future international legal regime and appropriate procedures respecting the disposition of the natural resources of the Moon and other celestial bodies.

APPENDIX

AMERICAN BAR ASSOCIATION REPORT TO THE HOUSE OF DELEGATES (May 1981)

RECOMMENDATION

The American Bar Association Section of International Law and Section of Natural Resources Law recommend the following resolution for adoption by the House of Delegates of the American Bar Association:

BE IT RESOLVED that the American Bar Association

Believes that the content of international law governing the peaceful uses of outer space, including the Moon and other celestial bodies, is a matter of substantial importance to the national interests of the United States;

Believes that the United States should preserve its rights under existing international law to undertake national exploration and use of outer space, including the unilateral right to undertake both scientific exploration and commercial development and use of natural resources found in outer space; and

Believes that encouragement of voluntary international cooperation in outer space, arms control constraints on the use of outer space consistent with the security of the United States, protection of the environment in outer space, and safeguarding of life and health of persons in outer space, are legitimate interests of the United States and of the international community.

BE IT ALSO RESOLVED, therefore,

That the American Bar Association favors the signature and ratification by the United States of the "Agreement Governing the Activities of States on the Moon and Other Celestial Bodies" on the explicit condition that the United States Signature and Instrument of Ratification be subject to and include express Declarations consistent with the following principles:

"(a) It is the position of the United States that no provision in this Agreement constrains the existing right of governmental or authorized non-governmental entities to explore and use the resources of the Moon or other celestial body, including the right to develop and use these resources for commercial or other purposes, and no such constraint is accepted by this ratification.

"(b) It is the position of the United States that nothing in this Agreement in any way diminishes or alters the existing right of the United States to determine unilaterally how it shares the benefits derived from development and use by or under the authority of the United States of natural resources of the Moon or other celestial bodies;

"(c) Natural resources extracted or used by or under the authority of a State Party to this Agreement are subject to the exclusive control of, and shall be the property of the State Party or other authorized entity responsible for their extraction or use. In this context, it is the position of the United States that Articles XII and XV of this Agreement preserve the existing right of States Parties to retain exclusive jurisdiction and control over their facilities, stations and installations on the Moon and other celestial bodies, and that other States Parties are obligated to avoid interference with normal operations of such facilities;

"(d) Recognition by the United States that the Moon and its natural resources are the common heritage of all mankind is limited to recognition (i) that all States have the rights to explore and use the Moon and its natural resources, and (ii) that no State or other entity has an exclusive right of ownership over the Moon, over any area of the surface or subsurface of the Moon, or over its natural resources which have not been, or are not actually in the process of being, extracted or used by actual development activities on the Moon.

"(e) It is the position of the United States that no moratorium on the commercial or other exploration, development and use of the natural resources of the Moon or other celestial body is intended or required by this Agreement. The United States recognizes that, in the development and use of natural resources on the Moon, States Parties to this Agreement are obligated to act in a manner compatible with the provisions of Article VI (2) and the purposes specified in Article XI (7). However, the United States reserves to itself the right and authority to determine the standards for such compatibility unless and until the United States becomes a party to a future resources regime.

"(f) Acceptance by the United States of the obligation to join in good faith negotiation for creation of a future resources regime in no way constitutes acceptance of any particular provisions or proposed provisions which may be included in an agreement creating and controlling such a regime; nor does it constitute any obligation or commitment to become a Party to such a regime regardless of the contents of any such agreement."

MARITIME AND SPACE LAW, COMPARISONS AND CONTRASTS (AN OCEANIC VIEW OF SPACE TRANSPORT)

Hamilton DeSaussure *

Welcome to the new age of outer space. President Carter has stated that the advent of the shuttle will mark the second era in outer space development.[1] It is very likely that new transportation systems will accelerate manned activity in this new domain at a geometric rate.

Few realized, when the first Echo satellites were launched in the early sixties, the dramatic way in which communications satellites would fill the skies.[2] Nor did they realize how crowded the geostationary orbit would become and how great the need would be for international regulation. The first satellite to operate in geostationary orbit was Syncom 2, which was launched in 1963. Between one hundred and ten and one hundred and twenty satellites now occupy that orbit. From one-quarter to one-half of them are functioning.[3] A recent NASA study concluded that by the year 2000 there would be a tenfold increase in the international demand for communications satellite circuits.[4]

The emergence of a transportation system in space, particularly a reusable system, will promote the same exponential growth in the carriage of cargo, and in human activity. How will it grow? Will it be by each nation regulating its own transport systems independently, by commonly agreed upon standards and practices, or by a new international agreement regulating space transportation?

The answer lies partially in the degree to which the most technologically advanced states believe it to their advantage to work out internationally accepted practices for their space operations. The U.S. will have the Space Shuttle, the USSR their Salyut-Soyuz-Progress system, and France has Ariane. The Soviets are reported to be planning a reusable spacecraft.[5] China and Japan are trying to develop more sophisticated launch systems.[6] The answer also lies in how much priority the U.N. Committee on Peaceful Uses of Outer Space (COPUOS) assigns to the formulation of an international regime for space transportation. The subject of space transportation systems was an agenda item at the most recent session of the Scientific and Technical Subcommittee, but there was

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[1] Press, "U.S. Space Policy—A Framework for the 1980's," 35 Astronautics and Aeronautics 34 (1979).

[2] *See* Lay and Taubenfeld, The Law Relating to Activities of Man in Space 109-121 (1970).

[3] This is the estimate of Dr. Lubos Perek, former Chief of the Outer Space Affairs Division.

[4] N.Y. Times, Mar. 24, 1980, § D, at 1.

[5] Aviation Week and Space Technology, Jan. 8, 1979, p. 11; Feb. 18, 1980, p. 25.

[6] See U.N. Secretariat Report, International Implications of New Space Transporation Systems 7, 8 (Aug. 16, 1979).

no substantive discussion. The subject was not on the agenda of the recent session of the Legal Subcommittee.

A current report prepared by the International Aeronautical Federation at the request of the Scientific and Technical Subcommittee states:

". . . it is conceivable that with the projected growth in both launches and the population and size of orbiting satellites there will come a time when the probability of interference with spacecraft performance, and possibly even physical collision, may become high enough to require consideration [of a global traffic control system]."

This, in my view, is most certainly an understatement. It is not only conceivable, but inevitable. The only issue subject to doubt is as to the timing.[7]

Whether a space transport regime takes shape through unilateral practice, concordant national rules, or multilateral treaty, the maritime and aviation regimes for international carriage are important references. Commerce at sea and in the air space has flourished by virtue of stable, internationally accepted rules, which regulate navigation. The purpose of this paper is to examine a few of the more important aspects of the maritime analogy for their applicability to space transport.

Status of the Instrumentality

None of the existing multilateral treaties regulating the use and exploration of outer space provide any definition of a spacecraft or a space vehicle. To my knowledge no bilateral treaty does. A recent amendment to the NASA Act defines *space vehicle* as "an object intended for launch, launched or assembled in outer space, including the Space Shuttle and other components of a space transportation system, together with related equipment, devices, components and parts."[8] This definition seems broad enough to cover all space objects contemplated by the Outer Space Treaty.

The terms *spacecraft* and *space vehicle* seem to be used interchangeably in the Outer Space Treaty and in the Astronaut Agreement, and frequently refer to space objects which carry personnel.[9] The Liability and Registration Conventions refer to neither spacecraft nor space vehicle, only space objects and launch vehicles.[10] A great deal of confusion exists as to the exact meaning of the two underscored terms. The former Chief of the Outer Space Affairs Division, Dr. Lubos Perek, has stated that in technical literature, the terms *spacecraft, space vehicle,* and *space object* all mean the

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[7]*Id.* at 18.

[8]Pub. L. No. 96-48, § 308 (f), 93 Stat. 349; 42 USC 2458 b.

[9]Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, Including the Moon and Celestial Bodies (hereinafter Outer Space Treaty), Jan. 27, 1967, [1967] 18 U.S.T. 2410, T.I.A.S. 6347, 610 U.N.T.S. 205, Art. 5 (effective Oct. 10, 1967); Agreement on the Rescue of Astronauts, the Return of Astronauts and the Return of Objects Launched into Outer Space (hereinafter Rescue and Return Agreement) April 22, 1968. [1969] 19 U.S.T. 7570, T.I.A.S. 6599, 672 U.N.T.S. 119, Art. 1-4 (effective Dec. 3, 1968).

[10]Convention on the International Liability for Damage Caused by Space Objects (hereinafter "Liability Convention") March 29, 1972 [1973] 24 U.S.T. 2389 T.I.A.S. 7762 (effective Oct. 9, 1973); Convention on Registration of Objects Launched into Outer Space (hereinafter "Registration Convention"), January 14, 1975, [1978] 28 U.S.T. 695, T.I.A.S. 8480 (effective Sept. 15, 1976).

same thing.[11] This is supported by the McGraw-Hill Dictionary of Scientific and Technical Terms. It defines *spacecraft* as "devices manned and unmanned which are designed to be placed into an orbit about the earth or into a trajectory to another celestial body." (No definition is given in the dictionary for *space vehicle*.)

There has always been a need accurately to define aircraft and ships and to distinguish them from other objects which transit or occupy their respective spheres. A similar need will emerge to define those spacecraft used for transport and to distinguish them from other space objects.

The International Regulations for Preventing Collisions at Sea define vessels to include, "every description of water craft, including non-displacement craft and seaplanes, used or capable of being used as a *means of transportation* on water"[12] [emphasis added]. The INMARSAT Agreement defines the term *ship* as meaning "a vessel of any type operating in the marine environment (including inter alia) hydrofoil boats, air-cushion vehicles, submersibles, floating craft and platforms not permanently moored."[13]

It seems that as space travel grows, we will need to establish a common definition of transport spacecraft or space vehicles. That is, spacecraft used primarily to carry goods or personnel from one place to another. It will also be necessary to distinguish them legally from other varieties of space objects. The key to defining the spacecraft for transport is navigability. Does it have the *primary* function of transportation? Is it designed basically for space flight rather than parking in a particular orbit? The fact that many satellites have internal rocket propulsion enabling ground controllers to reposition them in space does not endow them with navigability. Communications, remote sensing, weather, and reconnaissance satellites are not designed or intended for navigation in space. They carry only sufficient fuel to reach the desired orbit and perform their mission. INTELSAT satellites have been recently supplied just enough extra fuel to kick them out of the geostationary orbit at the end of their useful life. A true navigable craft however has enough fuel to transverse space and return to a particular place or orbit.

Navigate has been defined as steering or directing a ship or aircraft.[14] Of all the space objects, it will be the spacecraft for the transport that most nearly resembles ships and aircraft. How should they be described to differentiate them from other space objects? Webster's dictionary defines *spaceship* as "a rocket propelled vehicle for 'travel' in outer space."[15] One might have preferred a definition which substituted the word *transport* for the word *travel*. It is broader. Transport clearly embraces cargo as well as human beings. If one adopts the test of navigability as described above, then a spaceship could be manned or unmanned. The U.S. Space Shuttle clearly qualifies as a

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[11]Interview with Dr. Perek, New York, New York, March 27, 1980.

[12]Convention on the International Regulations for Preventing Collisions at Sea (Oct. 20, 1972) T.I.A.S. 8587, Rule 3.

[13]Convention on the International Maritime Satellite Organization, INMARSAT, July 7, 1979 [1979] T.I.A.S. 9605, Art. 1.

[14]Webster's New World Dictionary 948 (2nd ed. 1974).

[15]*Id.* at 1364.

spaceship. So, I submit, do the unmanned transport orbiters being developed by the Soviet Union, Japan, and the European Space Agency.

Once having defined the spacecraft for transport as a spaceship, its classification according to ownership and use becomes important. At sea, different rights and responsibilities flow from a ship's legal characterization. There are warships, other governmental vessels (with a subclassification depending on commercial or public use) and private merchant vessels. At the highest end of the scale is the warship. It enjoys complete sovereign immunity from foreign jurisdiction and has certain extraordinary rights on the high seas. Other governmental ships used for public purposes also have sovereign immunity, but not the special rights of warships. In most states, governmental ships used for private purposes no longer have immunity and, of course, neither do private merchant vessels. It has been necessary to classify vessels in order that all who use the high seas, or participate in maritime activity, understand the respective rights and duties of each type of vessel.[16]

The dawn of the new space transport era will bring a similar need to classify spaceships. The latest draft of the Law of the Sea negotiating text defines a warship as one bearing distinctive marks, commanded by a commissioned officer, in the service registry, and with a crew subject to military discipline.[17] A recent report indicates that out of a total of thirty-nine U.S. shuttle missions scheduled through September 1984, five are dedicated military missions.[18]

As the capabilities of the shuttle are demonstrated through experience, this is probably an underestimate of both the total number and the number of military missions. Should spaceships from the very outset be separately classified according to mission? In my view the answer is yes. Unlike other space objects, spaceships are instrumentalities of navigation. They are capable of a wide variety of tasks including military ones. Those ships operated by the military for military purposes, like their counterparts at sea and in the airspace, need particular identification. Following along the lines of the Law of the Sea draft, military spaceships should be defined as those which are under military control and whose ground controller or space crew are subject to military discipline.

At the initial stage of development, the spaceship will be an experimental vehicle, serving predominantly science, exploration and national security. As it begins to achieve economies that make it commercially useful for industry and for non-launch states, the spaceship will become an instrument of trade and commerce. It is interesting to note that under the U.S. Sovereign Immunities Act, a foreign state is not immune from U.S. jurisdiction in admiralty actions to enforce maritime liens against governmental vessels or cargoes used in commercial activity.[19] However, U.S. public vessels may not be

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[16]For a general discussion of the legal regime of warships and merchant ships, *see* Chapters VII and VIII, Colombos, International Law of the Sea 259, 285 (6th ed. 1957).

[17]Art. 29, Revised Informal Composite Negotiating Text for the Eighth Session, United Nations Conference on the Law of the Sea, March 19-27, 1979. The text is in 18 Int'l. Legal Materials 686, 709 (1979).

[18]Aviation Week and Space Technology, Mar. 31, 1980, pp. 54-55.

[19]Foreign Sovereign Immunities Act of 1976, 28 U.S.C. 1605(b). Under the Public Vessels Act, however, no lien may be created against any public vessel of the U.S. 46 U.S.C. 781, 788. In some foreign states, U.S. public vessels used for commercial activity may be subject to a libel action.

libeled in the United States. Some foreign nations refuse to accord any immunity to property owned by foreign governments and used in trade and when shuttle orbiters carry substantial commercial payloads, they may well be equated to public property used for private purposes and subject to attachment.

Dr. John Cobb Cooper, the first Director of the Institute of Air Law at McGill, wrote that vessels have a *sui generis* status.[20] While land transportation entities have no distinctive status, and aircraft have only nationality, vessels also possess a quasi personality which permit them to be held personally responsible for contracts and torts independent of owner responsibility. Justice Story wrote that a shipowner's innocence of any offense made no difference in the condemnation of a vessel suspected of "piratical aggressions."

"It is not an uncommon course in the admiralty, acting under the law of nations, to treat the vessel in which or by which, or by the master or crew thereof, a wrong or offense has been done as the offender, without regard whatsoever to the personal misconduct or responsibility of the owner thereof."[21]

Without delving into the subject of maritime liens, it is apparent that to vest spaceships with the same quality of responsibility attributed to vessels could have dramatic implications. A spaceship, part of whose payload is carried under contract with a private corporation, which lands on foreign soil through intent or accident, might find itself the subject of an in rem proceeding brought by a foreign claimant. Nothing in the Liability Convention prevents judicial recourse by private claimants even where that Convention might apply.

As spaceship operations become routine and the options they afford for commercial venture more advanced, their legal status becomes a matter of great importance and so will the analogy to public and private vessels.

The Right of Passage

Defining and classifying spaceships is only the start. Greater activity in space means more launches, which could mean more launch sites, or, as they will certainly come to be known, spaceports. There are probably fewer than a dozen separate launch facilities in the world today. Since the cancellation by Zaire of a contract with OTRAG, a private West German company for the development of a private launch facility in that country, all launch sites are owned and operated by Governments or Intergovernmental Organizations. However, there are those who believe that commercial launch sites are on the horizon and that they will multiply as commercial space ventures prove feasible. Eight nations have expressed interest in establishing new international launch facilities. Five of these are equatorial states. Will there be, before the end of the century, an explosion in space transport to equal that generated by air transport in the last quarter of a century? It is certainly a distinct possibility.

The rapid proliferation of communications satellites may prove an interesting precedent. Technological advances and economies of increased spacecraft production

[20]Cooper, The Legal Status of Flight Vehicles Explorations in Aerospace Law 206-213 (Vlasic ed. 1968).

[21]*The Malek Adhel*, 43 U.S. 210, 233 (2 How. 1844).

will provide direct access to space for more and more states. This will require the greater traverse of foreign airspace.

Many writers have addressed the problem of innocent passage through airspace to the outer space and have suggested the development of a rule comparable to the right of innocent passage for ships through territorial waters.[22] I prefer the analogy to the landlocked state. That state has no access to the unique environment of the oceans except through the territory of another. It has no sea coast. Without a freedom of transit such a state cannot reap the benefits of ocean transport. In the same manner, states who develop the capability to launch vehicles in space may not be geographically positioned to do so without transiting foreign airspace. They too are landlocked. The Geneva Convention on The High Seas provides that landlocked states shall enjoy the right of free access to the sea and equal treatment in ports.[23] A similar right is needed in space. It is at the outset of an active transport era that the greatest opportunity lies for the establishment of the principle of free transit to and from space. This right is less likely to emerge from the practice of states than by bilateral or multilateral agreement. Free transit through foreign air space would reduce the urgency to set forth a geometric border between air and outer space.

The Exercise of Exceptional Jurisdiction

The maneuverability of the spaceship will make it possible to approach and inspect alien satellites which are suspected of being a threat to the earth environment. It will be possible to remove the satellite to a high energy orbit, neutralize it, or control its return to earth.[24] The Outer Space Treaty makes it clear, however, that the registry state retains jurisdiction and control over its space objects and undoubtedly this is meant to be exclusive. Any exercise of control over a foreign satellite would have to be on exceptional grounds.

The corollary to the principle of the freedom of the high seas is that all states normally have a duty not to interfere with foreign ships outside territorial waters. In a famous admiralty case a British Judge declared,

> In places where no local authority exists, where the subjects of all States meet upon a footing of entire equality and independence, no one State, or any of its subjects, has a right to assume or exercise authority over the subjects of another.[25]

However, there is an exception to this principle of freedom of navigation. This exception involves the high seas right of approach. It is the right of any warship to approach a suspicious merchant vessel and verify her nationality and ensure she is not

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[22]*See* e.g., Christol, "Innocent Passage in the International Law of Outer Space," 7 Jag L. Rev. 22, 29 (1965).

[23]Convention on the High Seas (1958) T.I.A.S. 5200, Art. 3.

[24]*See* this writer's view on the removal of earth threatening satellites in 3 Ann. Air & Space L. 383-394 (1978).

[25]Le Louis 210 (2 Dods. 1817) quoted in Colombos, *supra* n. 16, at 310.

violating international law relating to fishing, submarine cables, and piracy, as well as misuse of the national flag. If the crew of the warship decides to board the suspect vessel, there is a heavy burden to substantiate the suspicion. Failure to do so makes the flag state liable for the loss, damage or delay to the merchant ship.[26] Whether a similar exceptional right of approach will develop in space rests on the good will of spacefaring states. Both the fall to earth of the Soviet Cosmos 954, breaking up over an area of northwest Canada about the size of Austria, and the uncontrolled return to earth of parts of the eighty-five ton Skylab, illustrate the risks involved in deteriorating satellites.[27]

The use of nuclear power sources in space is now being studied by a working group of the Scientific and Technical Subcommittee.[28] But nuclear power is only one specific source for earth contamination. There are other threats as well, including the possibility of physical damage. The ultimate answer lies in an international agreement for the safe deorbit or reorbit of satellites which threaten the environmental norm. Until such agreement is reached, military spaceships of any nation should have the right to approach a hazardous satellite and take preventive measures.

Safety of Navigation

It might appear at present that space voyages will not require the type of uniform rules for navigation that govern at sea. Space is limitless, the public oceans are not. Sea transit will far exceed space transit for decades to come. The risk of actual collision between two manned craft in space is minimal when compared to shipwreck and collision. However, the near earth and geostationary orbits will be the most frequented areas of space and as noted above there is already overcrowding in the latter orbit. As fully reusable launch systems transport large payloads from earth to low orbit and return them, and as reusable space-based orbital vehicles develop to transfer men and equipment from low to high orbit and to land on celestial bodies, uniform rules will be required to govern landing, docking, staging and inter-orbital transfers. It is an inexorable certainty that a navigation code will become as necessary for space safety as it became for traffic safety in the air space and at sea.

International rules of navigation applicable to high seas navigation have been enacted by virtually all maritime states, and amendments are usually made simultaneously by international agreement. The International Regulations for Preventing Collisions at Sea of 1972 are a part of these rules. They set forth measures to avoid collision, for maneuvering, towing, warning and distress signals.[29] There have been a number of conferences between maritime states called for the purpose of

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[26]*Supra* n. 16, at 311.

[27]For an excellent analysis of the deorbit of Cosmos 954, see Galloway, "Nuclear Powered Satellites: The U.S.S.R. Cosmos 954 and the Canadian Claims," 12 Akron L. Rev. 401 (1979).

[28]*See* Report of the Scientific and Technical Subcommittee on the Work of its Seventeenth Session, A/AC.105/267, Annex II, 1 (1980).

[29]*Supra* n. 12, rules 12-33.

standardizing rules for structural safety, fire and life saving equipment, and the use of radio and other navigational aids.

Whether an international space traffic code emerges through the concordant national legislation and regulation of the principal spacefaring nations, or through formal international agreement, it will become imperative to achieve uniform standards and practices. The Scientific and Technical Subcommittee working group on the use of nuclear power sources should be invited to consider the larger question of spaceship safety and to set forth suggested rules for uniform practices.

Status of Crew and Others

The Outer Space Treaty provides that all parties should regard astronauts as envoys of mankind.[30] What special protection this affords, apart from providing all possible assistance in the event of accidents, distress, or emergency, is not clear. It is true they will not be treated as diplomatic envoys with governmental immunity. If they are forced down in foreign territory or on the high seas they will have a temporary diplomatic immunity until they are returned to their own country. To what further protection are they entitled?

Seamen have long been regarded as wards of the admiralty. They are endowed special protection not accorded fellow workers on land, except by statute. Two ancient rights which they have acquired through practice and usage are the rights to maintenance and cure, and to a seaworthy vessel. Whenever a seaman becomes disabled during a sea voyage through sickness or accident, he is entitled to the continuance of his wages until restored to health, and to all medical expenses. This duty of the shipowner to provide all necessary treatment is an absolute one, not dependent on his negligence or on the freedom from fault of the seaman. The seaworthiness of the vessel is also an absolute requirement, and due diligence and care by the shipowner provides no exoneration for him if the court finds the vessel was not fit for whatever reason or cause. The concordant practice of maritime states has shaped a very strong maritime law in this regard.[31]

Will states whose nationals sojourn into space develop a similar set of protective rules for all spacefarers? I think it likely. Land-based rules for employer liability are shaped around work done "in the course of employment" and "within the scope of authority." On-duty and off-duty status and whether the aggrieved employee was deviating from his normal route or performance become important considerations. In space, as at sea, the spacefarer should be comprehensively protected without regard to any of the legal considerations. Whether his travel into space is for only a few days, or for weeks or months, he has a high risk occupation and his duty period, like that of the sailor, is for twenty-four hours each day. Consider how appropriate to the future spaceman is the language used by Justice Rutlege in describing the sailor's life. He wrote:

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[30]Outer Space Treaty, *supra* n. 9, art. 5.

[31]*See generally* on the subjects of maintenance and cure, and vessel seaworthiness, Gilmore and Black, The Law of Admiralty 151-155, 281-314 (2d ed. 1975).

> . . . . Unlike men employed in service on land, the seaman, when he finishes his day's work, is neither relieved of obligations to his employer nor wholly free to dispose of his leisure as he sees fit. Of necessity, during the voyage he must eat, drink, lodge and divert himself with the confines of the ship. In short, during the period of his tenure the vessel is not merely his place of employment; it is the framework of his existence. For that reason, among others, his employer's responsibility for maintenance and cure extends beyond injuries sustained because of, or while engaged in activities required by his employment.[32]

Federated States such as the U.S. should exercise legislative and judicial jurisdiction only at the national level. In the United States, a Federal Wrongful Death statute for outer space is needed which would preempt state law. It might be useful to extend the Death on the High Seas Act to activities in space.[33] The Federal Tort Claims Act should be amended to specifically cover acts in space and further revised to include claims based on strict liability for governmental conduct.[34] As long duration voyages and habitation in space become a reality, the relatively short statute of limitations for judicial recourse needs to be extended. In admiralty, by constitutional grant, Federal jurisdiction is exclusive (with certain exceptions not relevant here).[35] A uniform national space law is preferable to the hodgepodge of tort law applicable to aviation mishaps where state as well as Federal law is relevant. The working conditions of space crews and other personnel, minimum health standards for space flight, the provision for medical care and the extent of disciplinary authority of the mission and flight commanders must be defined only at the national and international levels.

On March 7, 1980, NASA promulgated rules on the authority of the shuttle commander in flight.[36] Shuttle commanders have been given authority similar to that held by sea captains and aircraft commanders including the power to arrest and to use force if necessary to maintain law and order in orbit. The rules also establish a chain of command on board the shuttle in the event the commander or his copilot are incapacitated. The new rules recognize that the shuttle will carry non-NASA scientists, engineers and foreign researchers.

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[32]*Waterman, S. S. Corp Jones,* 318 U.S. 724, 731, 733 (1943).

[33]Death on the High Seas Act, 41 Stat. 537, 46 U.S.C. § 7, 1-768 (1920). It has been judicially extended to death *over* the high seas. In *D'Aleman v. Pan American World Airways,* 259 F 2d 493 (1958) Judge Moore wrote, "The law would indeed be static if a passenger on a ship were protected by the Act and another passenger in the identical location three thousand feet above in a plane were not." It is extremely doubtful whether courts will judicially extend that Act to deaths on board an orbiting spaceship. But there is a similar need in space to unify the law. Courts have clearly held that the need for uniformity at sea required the DOHSA to supersede any state wrongful death statute. *See Dugas v. National Aircraft Corp.,* 438 F. 2d, 1386 (1971).

[34]The applicability of the Federal Tort Claims Act to acts in outer space has not been examined by the courts. F.T.C.A. 28 U.S.C. 1346 (b), 2671. Legislation precludes its applicability in cases where admiralty jurisdiction applies (see § 741-752 of the Suits in Admiralty Act 46 USC 741 et. seq. Since the F.T.C.A. is basically territorial in scope, it will not, in my view, be held to apply to negligence which occurs in the outer space environment.

[35]U.S. Const. art. 3, § 2.

[36]45 Fed. Reg. 14845 (1980), 14 C.F.R. 1214.

As one of the two great spacefaring states in the world, U.S. law and practice on space welfare will set the mark for other nations to follow as they develop their own space transport systems either in concert with other states or individually.

Salvage

Some years ago, Mr. Page, the President of the General Electric Missiles and Space Division, predicted there would be a million satellites in earth orbit in the 1990's. As time slips by, this prediction seems much too optimistic. There are approximately 4,500 space objects orbiting earth at the present, about one forth of which are functioning.[37] Although he may have miscalculated, the problems implicit in his prediction will be generated. The U.N. Secretariat's Report states it will "almost certainly" be necessary in time to sweep non-geostationary orbits planned for extremely large structures, such as those planned for in space construction of solar power satellites.[38] It is also true that much of the artifacts brought into space will be salvageable. The Astronaut Agreement does not address the question of salvage. It does provide that, upon request, objects launched into space found outside the launching state shall be returned or held at that state's disposal. It also provides for the recoupment of expenses.[39]

At sea, every recovery of lost or abandoned property, or property in peril, is subject to a salvage claim. Though limited to the value of the property saved, the award can be far in excess of expenses. This depends on the hazards involved, the value of the property at risk, the value of the property saved, and other considerations.

There is a duty imposed on the master of every vessel to render all assistance in saving life at sea and there is no reward for life salvage. The salvage of property at sea is a voluntary act and here a generous reward is possible except for those public ships such as Coast Guard vessels which have a duty imposed by law.[40]

The law of maritime salvage has been stated to be a part of international law, and the courts of maritime states have taken a liberal attitude toward entertaining salvage claims against a ship libeled in their ports. This is true even though the only contact with the port state is that the rescued ship was brought there after rescue. In maritime practice a wide variety of acts have been held to constitute salvage from simple towing to a place of safety to raising a sunken vessel. Will this body of maritime law have any relevance in space? I think the analogy is appropriate and that the need for uniformity, a *jus gentium* in space, is equally necessary. The question of who may become salvors, how the award should be computed and distributed, who is liable for the award, and what types of salvage may arise under contract will become important considerations in rescue operations in space.

It is not too early for an appropriate body such as COPUOS to consider whether a salvage law for space will require an international agreement comparable, perhaps, to

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[37]Interview with Dr. Perek, *supra* n. 11.

[38]*Supra* n. 6, at 18.

[39]Rescue and Return Agreement, art. 5 *supra* n. 9.

[40]*See* Norris, The Law of Salvage, § 172-179 (1958).

the Brussels Salvage Convention of 1910, or whether it can best develop through national law and practice.

Protection of the Environment

Already mentioned in connection with the need to control earth-threatening satellites such as unstable nuclear powered satellites is the need for a safety regime in space. However, the question of back and forward contamination in space is much broader than just the exercise of any right of removal of deleterious space objects. A special set of safety standards, uniformly adopted throughout the community of spacefaring states, is extremely desirable.

The Geneva High Seas Convention provides that every state shall draw up regulations to prevent pollution of the seas by the discharge of oil from ships and shall take measures to prevent pollution from the dumping of radio-active waste.[41] The International Maritime Consultative Organization (IMCO) has sponsored both the Convention for Oil Pollution Damage and the Convention on the Prevention of Marine Pollution by Dumping Wastes and Other Matters. The U.S. is a party to both.[42]

Respected admiralty lawyers have stated that ocean contamination presents "problems of staggering complexity as to which no consensus has yet emerged."[43] No less than 45 articles are devoted to the protection and preservation of the marine environment in the most recent draft of the Law of the Sea negotiating text. While it should be superficially attractive to transfer concepts being developed in this most vital area from the sea to space, it probably is not a useful analogy. First, because the law of the sea is itself in a state of confusion on this subject, and second, because the distinctive characteristics of the two environments call for entirely different approaches to the problem. Nevertheless, there must be a uniformity of approach, common standards and an international repository for the communication and exchange of all information on space contamination.

Conclusion

While the law of the sea does not represent an infallible guide to the developing law of space, space lawyers need some appreciation of maritime law. They need to become conversant with basic admiralty rules to vessel identification, navigation, management of ships, rights of seamen, the law of salvage, limitations of liability and governmental activity in sea commerce. It is with this perspective that they can compare the two environments, consider the relevance of maritime law, and select for adoption for space transport those legal principles which have proved beneficial to commerce on the oceans.

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[41]High Seas Convention, *supra* n. 22, art. 24, 25.

[42]Oil Pollution Convention, May 12, 1954 (1954) T.I.A.S. 4900; Dumping of Wastes Convention, December 29, 1972, T.I.A.S. 8165.

[43]*Supra* n. 30, at 826.

SIGNIFICANT DEVELOPMENTS IN SPACE LAW: A PROJECTION FOR THE NEXT DECADE

Stephen E. Doyle *

Ongoing Space Programs in 1980

Basically, the main elements of ongoing space programs may be divided into five categories: applications of space technology, space science and exploration, space transportation, space tracking and data acquisition, and related technologies research and development.

"Space applications" is an encompassing term including many current activities of both national and international character. Employment of satellites for communication purposes is perhaps the best known, most widely used of space applications. There are five countries with totally independent national communication satellite systems: U.S.S.R., Canada, the United States, Indonesia and Japan. In all of these countries the systems provide point-to-point relay of telephone, telegraph, facsimile, television and data services, and in some countries there are dedicated facilities used for both radio and television broadcasting. There are at least fifteen countries, maybe more, that use the multilaterally owned spacecraft of the International Telecommunications Satellite Consortium (INTELSAT)[1] for domestic communication services with wholly owned national earth station complexes. There are some countries involved in regional systems for satellite communication and there are more than one hundred and twenty-five countries using international satellite systems to help meet their global communication requirements.

"Space applications" also include meteorological satellite systems, which can collect and deliver broad-area cloud cover pictures, meteorological data and certain kinds of time-sequence imagery of weather patterns. Combined with ground-acquired data and computer systems, these space systems have permitted greatly improved capability to find, analyze and predict meteorological phenomena.

Another important "space application" is the sensing of the earth's surface from space, whether land or water. Nations use both active (radar) sensing systems and passive (latent or reflected electromagnetic radiation) sensing systems, and data is collected that is useful for cartography, crop inventory, forestry, land management, pollution control, geographic, geologic, and oceanographic work, to mention only some of the important uses. Developed and developing countries gain substantially from the use of such earth sensing data collection systems.

There are other more specialized "space applications," including mobile, maritime and aeronautical communications; surveillance and verification systems; navigation systems; continuous surface and atmospheric monitoring data relay systems;

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[1]Agreement Relating to the International Telecommunications Satellite Organization, INTELSAT, with Annexes, [1971] 23 U.S.T. 3813, T.I.A.S. 7532.

and amateur radio relay. "Space applications" also include experimental work done in laboratory environments, as in Apollo spacecraft, Skylab, Soyuz, and Salyut, and in the Apollo-Soyuz Test Project of 1975. This includes materials processing for crystal growth, alloy mixing, pharmaceutical blending and, eventually, manufacturing processes that can turn a near zero-G environment or a near perfect vacuum into an advantage, or a medical or surgical benefit.

All of these "space applications" represent what we know and what we believe we can do and, in some cases, are doing today. But experience teaches us clearly that it is likely that we will discover new applications, new systems, new technologies and new uses, that have not yet crossed our minds. We are not at the end of our experience with "space applications," we are just beginning!

In the area of "space science and exploration," we are also only just beginning. We are beginning to perceive the intricate, complex relationship between the earth and the sun; the nature, flow and effects of the solar wind, solar flares and extra-solar radiation sources. We are still measuring and defining the near-earth environment in space, essentially the characteristics of the cis-lunar sphere, lying within the distance from the earth to the moon. And, we are beginning now to digest and appreciate what we have learned about the moon itself—its composition, history, value to and relationship to the earth. We are gaining a clearer view and better understanding of the planets of our solar system and their many satellites. And we are learning a great deal about extra-galactic space, the nature and life cycle of stars and nebulae, the composition, behavior and interrelationships of galaxies, and we are discovering anomalies and new mysteries such as pulsars, quasars and black holes!

It can be said of "space applications" and "space science and exploration" that nations have enjoyed and benefited from a wide range of successful, productive international cooperative programs in these areas. Major new institutions have arisen to carry out space applications programs and some important new organizations are emerging in the space science areas, institutions like the Lunar and Planetary Institute in Houston, Texas, and the contemplated astronomical institute to collect, analyze and archive data to be acquired by the planned 2.4-meter space telescope now being built. Space dependent organizations like INTELSAT, Intersputnik, the European Space Agency (ESA), INMARSAT and the Arab Communication Satellite Corporation didn't exist twenty years ago, but they do and can provide vital global and regional services to many countries.

As a contrast, in "space transportation," for reasons of national security interests, proprietary interests, national prestige and economics, there has not been the extensive sharing of technological know-how and experience that characterizes space applications and space science. In "space transportation," some nations have preferred to retain their independence and autonomy and there has been a more apparent spirit of competition. Early in the spaceflight era, i.e., in the early 1960's, the United States opened access to its launch capabilities to all nations, and in 1972, the President of the United States formally declared such availability to the entire world, for peaceful applications on a non-discriminatory basis.

Today, in the "space transportation" area, new regional and national launch competence is being demonstrated. In addition to the major launch programs in the U.S.S.R. and the United States, there are modest capabilities in other countries to orbit more limited payloads, such as in France, China and Japan, and an important new

regional capability was successfully demonstrated on December 24, 1979, when ESA successfully launched Ariane-1 from the jointly sponsored launch range located in Kourou, French Guiana. The United Nations Committee on the Peaceful Uses of Outer Space reviewed in some detail, for the first time last year, the status of space transportation systems, their development and availability to member states. The United Nations will and should continue to monitor the activities of states in regard to use of and sharing of space transportation capabilities.

The United States is moving forward in its development of a reusable space orbiter known as the Shuttle. This remarkable vehicle represents a major new step in the technology of space transportation and, not surprisingly, it is experiencing some temporary delays in the process of proving a wholly new, significantly improved launcher capability. But such problems are to be expected in so complicated and sophisticated an undertaking.

The Shuttle will add a major new capability to the world's stable of launch vehicles. With 60,000 lb. payload capability and up to 30 days orbital stay time, combined with ESA's nearly completed Spacelab, it will offer a shirt-sleeve working environment, on-orbit, for astronaut-scientists who are now in training. The Shuttle's technological development is possibly the most important event that will occur in space transportation in the next decade.

In "space tracking and data acquisition" programs, too, a new era is dawning. Whereas in the 1960's and 1970's spacefaring nations had to locate tracking stations in many countries, in aircraft and on ships at sea to keep track of and communicate with spacecraft and space vehicles, we will soon see, deployed by the United States, a new system for tracking and data acquisition, based upon geostationary satellites located above the Atlantic and Pacific Oceans. The new Tracking and Data Relay Satellite System (TDRSS) will be commercially operated and leased to NASA on a dedicated basis to support missions involving U.S. originated spacecraft and Shuttle operations. Of course, the current NASA Deep Space Network (DSN), which employs large disk antennae at earth stations in Australia, California, and Spain, will continue to serve space missions beyond the coverage capability of the TDRS system.

Coming then to "space technology research and development" we really come inexorably into the realm of prediction. What will happen next? What will nations independently and cooperatively do? With what legal consequences and implications? But before describing what I believe will occur legally in the decade of the 80's, permit me to briefly sketch the space technology of the 80's.

Technological Developments in the Next Decade

We need not worry whether or not space technology will be developed—it will. National and cooperative international programs will continue to drive developments to lower costs, increase reliability, enhance survivability, increase flexibility and increase access to space services and systems. Especially in applications areas such as meteorology, communications, remote sensing, navigation and materials processing, major new strides will be taken, even by nations other than the United States and the U.S.S.R. Nations will continue to develop scientific instrumentation, sensors, detectors, recorders, analytical tools and skills to increase our learning speed and ability in space science and exploration. For the reasons enumerated above, selected nations will forge

ahead in development of new, less costly, more reliable, capacious launcher systems. Space transportation will continue, however, to be an area characterized by limited cooperation, closely controlled sharing of know-how and preciously guarded technologies. Depsite these limitations, I believe there will be more choices of launch service sources and more diversity of capabilities. I have privately expressed the opinion to close associates for several years that in due course the U.S.S.R. will enter the market of launch services as a provider. The Russians still have a great deal to learn about how to work with other non-communist nations in cooperative arrangements.

As the 1980's unfold, in addition to continued concentration on non-manned, service-oriented systems, I believe nations, preferably in groups, will renew attention to problems and technologies associated with man in space. Manned facilities will be developed for research, work and construction stations in low earth orbits (LEO), probably no higher than 500 miles. There will be improved technologies for power supplies, power storage and eventually (possibly by the turn of the century) power transmission to the earth's surface. Manned and unmanned orbital transfer vehicles will be developed to facilitate movement of persons and supplies between and among various orbits and orbital locations. New fabrication devices are going to appear, along with sophisticated remote manipulator systems.

Of course, while these technologies are being developed and tested we will also have to learn more about the effects of long stay time on man. We will add to our biological, physiological and psychological understanding of ourselves. An important new space technology spin-off will appear on earth—the automation to do routine work and repetitive functions. But they will not cost millions of dollars, as they have in the past; they will cost a few hundred dollars. New and/or better biological processes will be developed for food production, waste recycling and other life-support related functions. A new industry in space recreation will begin to emerge. There will be a flow-back to earth of benefits derived from new, strong, light-weight materials and new methods of collecting and converting solar energy to other usable forms. We will learn how to construct new habitats that will become "trendy" on earth, new clothes, new food forms. To be sure, we may not see *all* of these kinds of things within a decade, but short of some unforeseen cataclysm or a major, devastating war, these things may be expected to occur because they are the logical extension of the history of man. Such things as major manned stations in high earth orbit or at geosynchronous altitudes, solar power satellite systems, manned colonies in space are not beyond man's capability or beyond our capacity to realize, though admittedly, they are somewhere beyond the next decade!

Space Law in the Next Decade

Turning now to the questions raised earlier about the law, legal needs, legal implications, legal consequences of all these amorphous speculations, the next ten years of space law will not be a period of isolated development. It will be a period of growth, based on current foundations, and it will be a period of adaptation and creation of concepts to meet new needs. In the last fifty years, the world's legal community has produced a body of space law, some parts in isolation at first, through orchestrated harmonization and accommodation. After a period of exploration and speculation in concepts and principles, prior to the first orbiting of a manmade object in 1957, there came a period of definition and consolidation of fundamental principles. After a

number of major declarations in the form of U.N. General Assembly Resolutions, the Outer Space Treaty of 1967[2] emerged. There then followed a period of elaboration and regulation. We are still in that phase of legal development, and we will be for an indefinite time. In these evolutionary phases the newest separable phase has only recently opened. It may be called the extraterrestrial law phase, beginning in December 1979, when the U.N. General Assembly promulgated the Moon Treaty.[3]

While separate national legislatures dealt in separate ways with perceived needs for national law based on levels of national activities related to space, international law began to grow into the body of space law known today, almost immediately after the first Sputnik launch. The international law began through bilateral contracts, arrangements and agreements. These evolved and paralleled regional developments that generated new regional organizations and agreements; and, in due course, the United Nations took on the central role of global coordination and formalization of new global treaties. Regulations began to emerge along with the new regional global organizations created to develop and exploit the technology.

To understand what will happen in the next decade, a clear picture of the current foundation is essential. The main strut in the foundation of international space law is the 1967 Outer Space Treaty.[4] From principles enunciated therein came the Rescue and return Agreement of 1968,[5] the Liability Convention of 1973[6], the Registration Convention of 1976,[7] and, in substantial measure, the Moon Treaty of 1979.[8] But there were, in addition, other events and legal activities of import, such as the 1959 World Administrative Radio Conference, the 1963 Extraordinary Administrative Radio Conference, the 1964 INTELSAT Conference, the 1971 World Administrative Radio Conference on Space Communications, the 1971 Intersputnik Agreement, the 1977 World Administrative Radio Conference on the Broadcasting Satellite Service, the 1977 INMARSAT Conference and the 1979 World Administrative Radio Conference. All of these conferences and agreements may be only a prelude in comparison with world radio conferences now scheduled and anticipated in the 1980's. Also, activities of the General Conferences of UNESCO during the 1970's deserve to be mentioned as important

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

[3]Draft Agreement Governing the Activities of States on the Moon and Other Celestial Bodies (herein referred to as the "Moon Treaty"), U.N. GAOR, 34th Sess., Supp. No. 20, Doc. A/34/20 (1979).

[4]Outer Space Treaty, supra note 2.

[5]Agreement on the Rescue of Astronauts, the Return of Astronauts and the Return of Objects Launched into Outer Space, April 22, 1968, [1969] 19 U.S.T. 7570, T.I.A.S. 6599, 672 U.N.T.S. 119 (effective Dec. 3, 1968).

[6]Convention on International Liability for Damage Caused by Space Objects, March 29, 1972, [1973] 24 U.S.T. 2389, T.I.A.S. 7762 (effective Oct. 9, 1973).

[7]Convention on Registration of Objects Launched into Outer Space, Jan. 14, 1975, [1978] 28 U.S.T. 695, T.I.A.S. 8480 (effective Sept. 15, 1976).

[8]Moon Treaty, *supra* note 3.

contributors to the understanding of predictions for the 1980's. Apart from these meetings other plenipotentiary conferences and conferences of a constitutional nature should be recalled, including the Conference to formulate the law of the sea.

For an attentive student of space law, the last two decades may appear to have been a hectic but undeniably productive time. From now on the productivity level for international space law may be expected to show a decreasing growth rate with a possible leveling of the curve toward the end of the next ten years. But as international space law creation stabilizes, a new series of national and regional laws and arrangements will emerge. New national and international laws will be discussed or proposed to deal with such matters as: insurance and liability claims; protection of patents and proprietary rights originating in space; codes of conduct and possible international criminal law to regulate man's behavior in space, new forms of sanctions for non-respect of laws; new institutional forms to facilitate more and better international cooperation; standard or model contracts or agreements for purchase or lease of space-related services; regulations for specialized space-based services; regulations for piloted vehicles moving about in space; regulation of the use and exploitation of extraterrestrial resources; settlement regulations for persons interested in relocating in space, and international registration procedures for persons, vehicles and activities in space. The United Nations will continue to provide the central focus for international coordination and reporting of space-related activities and, in my opinion, the next decade will see the establishment of a new U.N. agency to deal with man's activities in space.

One major problem that will demand the best and most creative of all our skills, is how we will implement the new regime of "common heritage." Mankind, collectively, has a great deal to learn about and to gain from space, the space environment and space resources. We appear to have unanimously agreed that the 19th century's model of exploitation and conflict cannot be tolerated in the 21st century. But it must be understood that if there is to be no domination by a few countries, there reciprocally must be no domination by the majority.

The key concept for realizing the use and benefits of space is *equity*. Benefits cannot flow to the indolent. Non-contributors can take no measure of satisfaction from the labors of others. Opportunities must be nondiscriminatory and there must be a possibility for all to contribute to and share in endeavors in space. But returns must reflect contributions. There is no "free lunch."

The benefits of space are to be available to all nations, regardless of their levels of economic development; that is agreed. But that should not be read to mean that every nation has a right to share equally in benefits regardless of contribution. The international community still has some important clarifications to address in this area of equity. Hopefully, major strides regarding equity will be made within the next ten years.

THE MAJOR ISSUES IN THE "AGREED" PRINCIPLES ON REMOTE SENSING

Jean-Louis Magdelénat *

Foreword

In the United Nations Committee on Peaceful Uses of Outer Space (COPUOS), Canada noted, regarding remote sensing, that there is no automaticity in the application of international law to this new activity.[1] Professor Bin Cheng in a brilliant article denies this statement but adds: "What is true is that there is not a specific international legal regime governing remote sensing". This remark was made in March 1978[2] and still stands; almost no progress has been made since the 1978 version of the "Draft Principles on Remote Sensing of Earth from Space." The Working Group has agreed only to remove brackets or shift the sequence of the article. Some guidelines, however, have acquired the consensus of the delegates to the Legal Subcommittee of COPUOS. With time and the effective operation of remote sensing a general acceptance may be reached. Meanwhile, the two major issues are still discussed: the permissibility of sensing other States' territory and the dissemination of the resultant data and information.

I. Introduction

With the energy crisis, man realized the limited nature of global natural resources and the necessity of preserving the environment of our planet. It has not been surprising that those space technologies employed in the late 1950's and 1960's for purposes of military reconnaissance and meteorology have been extended to the study of the natural resources of the earth and its environment. This technology is termed remote sensing, a "system of methods for identifying the nature and for determining the condition of objects on the earth's surface and of phenomena on, below or above it, by means of observations from airborne or spaceborne platforms."[3] This paper will focus on the legal issues presented by remote sensing activities which, while conducted in space, are earth-oriented.

The sensing techniques employed on satellites take many forms. Besides sophisticated camera systems, infrared, microwave and ultraviolet sensors, as well as radar and laser instruments, are in common use.[4] Sensing can be either passive or active.

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[1]U.N. COPUOS Doc. A/AC.105/C.1/WG.4 L.11, para. 25 (1974).

[2]Cheng, "Legal Implications of Remote Sensing," Proceedings of an International Conference on Earth Observation from Space and Management of Planetary Resources, held at Toulouse, March 6-11, 1978 (ESA SP-134).

[3]U.N. Doc. A/AC. 105/98 (1972).

[4]Christol, "Remote Sensing and International Law", V Annals of Air and Space Law, 375 at 379 (1980).

Passive sensing involves the reading of the natural radiation emitted by an object. Active sensing, on the other hand, is accomplished by first transmitting electromagnetic radiation down to the object and then reading the reflected energy. Since each object emits differing amounts of electromagnetic radiation, it is possible to obtain its distinctive "spectral signature". This energy distribution differentiates the object from others and can indicate density, surface regularity, moisture content and various other physical and chemical properties.[5] Comparisons of the data collected in space are made with measurements taken of the object at the surface of the earth for correlation purposes. Over the years, sensing equipment has been refined to the point that objects on the ground can be identified with precision down to less than 10 meters.[6]

Remote sensing serves many functional purposes. Information can be gathered relating to the environment, agriculture and forestry, geography, geology and mineral resources, oceanography and marine resources, hydrology and water resources, and atmosphere-meteorology, including disaster assessment.[7] The environmental, economic, social, cultural and scientific benefits to be gained are obvious. As paradoxical as it may sound, through military surveillance satellites, remote sensing also serves to promote international peace and stability by providing a means of weapon verification.[8]

Any successful remote sensing system must contain three elements: (1) one or more satellites; (2) a ground data handling center; and (3) an adequate infrastructure, including a good interpretation and analysis capability and an effective structure for the making and carrying out of policy decisions.[9] The American LANDSAT Program is a prime example of both the versatility of sensing techniques and the organizational framework necessary for national and international benefits. LANDSATS 1 and 2, launched in 1972 and 1975 respectively, have already returned to earth after providing information on types and conditions of vegetation, surface, soil and rock conditions, water quality, and other information beneficial to man's needs.[10] LANDSAT 3, launched in 1978, is still functional and a fourth satellite is to be put into operation in 1982. LANDSAT data has been distributed to over 100 countries and there are 8 ground stations in 7 countries outside the United States. Bilateral negotiations are continuing for ground stations to be built in at least 6 other nations, including China. In Europe, ESA (European Space Agency) is planning its own sensing satellite and France alone is developing its Spot satellite for the same purpose.

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[5]Doyle, "Remote Sensing by Satellite: Technical and Operational Implications for International Cooperation" in N. M. Matte and H. DeSaussure (eds.), *Legal Implications of Remote Sensing From Outer Space* 5 (1976).

[6]Christol, *supra* note 4, at 380.

[7]U.N. Doc. A/AC.105/118, at 32-34 (1973).

[8]Christol, *supra* note 4, at 379.

[9]Henein, "Notes on the 'Real World' Framework for Space Law as Applied to Remote Sensing" in N. M. Matte and H. DeSaussure (eds.), *supra* note 5, at 141-142.

[10]Doyle, *supra* note 5, at 6-7.

Remote sensing has not developed without legal consideration. The United Nations Committee on the Peaceful Uses of Outer Space (COPUOS) has been the forum of most of these efforts.[11] Substantive discussions took place in Vienna in 1968 at the first U.N. Conference on the Peaceful Uses of Outer Space. The Scientific and Technical Subcommittee called attention to the use of remote sensing techniques as a means suited to the planning of global resources in 1969. In 1971, an interdisciplinary "Working Group on Remote Sensing of the Earth by Satellites" came into being as an organ within the Scientific and Technical Subcommittee and in 1974, the subject of the legal implications of remote sensing from space was placed on the agenda of the Legal Subcommittee. By this time, 7 proposals of draft principles were in existence: Argentina (1970);[12] France (1969);[13] the USSR (1973);[14] Brazil (1974);[15] France/U.S.S.R. (1974);[16] Argentina/Brazil (1974);[17] and USA (1975).[18] Working with these drafts, as well as input from other members of COPUOS, the Working Group of the Legal Subcommittee was able to identify 5 common principles in 1975.[19] In 1979 the number of principles stood at 17,[20] many, however, without consensus and subject to alternate formulations.

II. The Rights and Obligations of Sensing and Sensed States

A. Introduction

In 1976 the Scientific and Technical Subcommittee of COPUOS identified the structural aspects of remote sensing to include:

(1) Date acquisition (satellites and command stations);
(2) Data reception (antennas and receivers);
(3) Data pre-processing (formatting and recording);
(4) Data storage and dissemination (archiving and reproduction);

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[11]*See* Vlasic, "The Evolution of the International Code of Conduct to Govern Remote Sensing by Satellite Progress Report," 3 Ann. Air & Space L. 561-562 (1978).

[12]U.N. Doc. A/AC.105/C.2/L.73 (1970).

[13]U.N. Doc. A/AC.105/C.2/L.69 (1969).

[14]U.N. Doc. A/AC.105/C.2/L.88 (1973).

[15]U.N. Doc. A/AC.105/122 (1974).

[16]U.N. Doc. A/AC.105/C.2, L.99 (1974).

[17]U.N. Doc. A/AC.105/C.1, 1047 (1974).

[18]U.N. Doc. A/AC.105/C.2, L.103 (1975).

[19]U.N. Doc. A/AC.105/147, Annex 3 at 1-2 (1975).

[20]U.N. Doc. A/AC.105/240, Annex 1 at 7 (1979) (hereinafter referred to as "1979 Principles"), reproduced in 8 J. Space L. 147-149 (1980).

(5) Data analysis (interpretation or user processing);
(6) Information utilization (practical applications by users).[21]

The first four elements concern what is referred to today as "primary data" and which is defined as

> [T]hose primary data which are acquired by satellite-borne sensors and transmitted from a satellite either by telemetry in the form of electromagnetic signals or physically in any form such as photographic film or magnetic tape, as well as preprocessed products derived from those data which may be used for later analysis.[22]

The final two elements concern "analyzed information" which is the "end product resulting from the analytical process performed on the primary data combined with data and/or knowledge obtained from sources other than satellite-borne remote sensors."[23]

The 1979 Principles also define "remote sensing of the earth" as meaning "remote sensing of the earth and its environment."[24] While all three of the above definitions are subject to further debate, they serve as a starting point for this discussion. The major issues are: the right to sense, *ie,* the right of a State to acquire primary data of another State and the right of the sensing State to disseminate both the primary data and the analyzed information concerning the resources of the sensed State.

B. The Right to Sense

The right to sense has been the most controversial issue throughout the discussions in COPUOS. By 1979 a number of positions as to the legality and conditions under which remote sensing might take place had been articulated. These positions ranged from the uninhibited right to sense the resources of another State to one of a prohibition without the prior consent of the sensed State. The fundamental principle behind all this was that of sovereignty, with all of its political, economic and legal trappings. The sovereignty of the sensing State to participate freely in outer space activities confronted the sovereignty of the sensed State over its natural resources and, as advocated by some States, the information pertaining thereto. Between these two extremes were those States which accepted the legality and necessity of remote sensing in a general way and sought only prior notification or consultation regarding the sensing of their territory and those States which were more concerned with the dissemination of the primary data and analyzed information to third parties.[25]

Those States which would require prior consent as a pre-condition for the sensing of their territory based their arguments on territorial sovereignty, sovereignty over natural resources and wealth, and the security and economic considerations therein involved.

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[21]U.N. Doc. A/AC.105/170 at 8 (1976).

[22]1979 Principles, *supra* n. 20, Principle I (b).

[23]1979 Principles, *supra* n. 20, Principle I (c).

[24]1979 Principles, *supra* n. 20, Principle I (a).

[25]Christol, *supra* note 4, at 392-397; *see also* Cheng, *supra* note 2, at para. 2.1.

This position was put forth in the joint Argentina/Brazil Draft Treaty of 1974.[26] Article V of that Draft established the strict rule that States shall refrain from undertaking activities of remote sensing of natural resources belonging to another State without the consent of that State. Article VI of the same Draft provided that States will take all measures authorized by international law to protect their territory from remote sensing activities for which they had denied their consent. It is unclear whether this provision would extend to the destruction of the offending satellite by the sensed State.

Not unexpectedly, the United States has been the main proponent of the position advocating complete freedom to sense. It should be stated at the outset that this is the preferable view not only legally but also economically, socially and technologically. The United States has always maintained that the free collection of data is in accordance with international law.[27] Although earth-oriented, remote sensing is a space activity and, therefore, subject to the 1967 Principles Treaty and its fundamental principle that outer space is free for the exploration and use by all States. In the 1973 United Nations Secretariat Background Paper entitled "Legal Implications of Remote Sensing of the Earth by Satellites", it was stated: (1) there does not appear to be any principle or rule of international law that makes it unlawful for a country to freely observe everything and anything in another country so long as it carries out its observations from beyond the limits of national sovereignty; (2) the only restrictions are those contained in the obligation to act in accordance with international law and to respect the corresponding interest of other States, as well as the duty to inform the United Nations Secretary General and the public, to the greatest extent feasible and practicable, of the nature, conduct, locations and results of national space activities.[28] One can also point to customary international law which has evolved over the last decade from the established practice of States in conducting peaceful space activities.[29]

The United States' position was reiterated in the Presidential Directive of June 20, 1978, which provided that: (1) the United States rejects any claims to the sovereignty over outer space or over celestial bodies, or any portion thereof, and rejects any limitations on the fundamental right to acquire data from space; and (2) the United States will develop and operate on a global basis active and passive remote sensing activities in support of national objectives.

The right or freedom to sense is perhaps best justified on other than legal grounds. From the technical aspect, satellites are not able, despite their scientific sophistication to detect invisible political boundaries.[30] Such determinations would be necessary if the right to sense was premised on the prior consent of the many States scanned by the satellite. It is also clear that the problems to which remote sensing are addressed are of

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[26]*See* n. 17 *supra*.

[27]*See* Christol, *supra* note 4, at 395.

[28]U.N. Doc. A/AC.105/118 (1973).

[29]Christol, *supra* note 4, at 393.

[30]Leigh, "United States Policy of Collecting and Disseminating Remote Sensing Data," in N. M. Matte and H. DeSaussure (eds.), *supra* note 5, at 149.

global, or at least regional, proportion.[31] An open system of sensing and distribution of information would contribute to the preservation of the environment and effective management and control by States of their natural resources. The United States has long advocated international cooperation in these endeavors. These principles will be further developed when the right to disseminate primary data and analyzed information is discussed.

The Legal Subcommittee of COPUOS has been trying to formulate a legal framework for remote sensing activities since 1975. Many of the 1979 Principles, of which are seventeen, simply restate those principles found in such documents as the Principles Treaty, the Registration Convention, the Charter of the United Nations, the UN Declaration on Principles of International Law concerning Friendly Relations as well as general principles of international law.[32] The rights and duties of States are often articulated in the broadest of terms or are ambiguous. It should also be noted that those principles which are regarded as in derogation of the sovereignty of either the sensing or the sensed State are without consensus. All of the Principles, however, are based on the assumption that States have a right to engage in remote sensing of the earth and its environment.[33] Those principles which seek to impose specific conditions on the collection of data and dissemination of data and information do provide a useful starting point from which to establish a legal regime for remote sensing activities.

Areas of general agreement in the 1979 Principles include: the distinction between primary data and analyzed information;[34] the fact that sensing is to be carried out for the benefit and in the interest of all countries (but with special consideration for the needs of the developing countries);[35] and the understanding that sensing is to be subject to international law, the U.N. Charter and the 1967 Principles Treaty.[36] Frequent references are made to international cooperation.[37]

With respect to the right to sense, it is provided that a State which intends to conduct remote sensing of the earth from outer space shall give "advance notification" to the States whose territory will be sensed.[38] The Secretary General of the United Nations is also to receive notice of the sensing activities and publish such information received.[39] This is a much more liberal regime than that of "prior consent". In fact, it cannot be regarded as a serious abridgment of the freedom to conduct remote sensing of

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[31] *Id.*

[32] Vlasic, *supra* note 11, at 567.

[33] *See* Christol, *supra* note 4, at 411.

[34] 1979 Principles, *supra* n. 20, Principle I.

[35] 1979 Principles, *supra* n. 20, Principle II.

[36] 1979 Principles, *supra* n. 20, Principle III.

[37] *See* 1979 Principles, *supra* n. 20, Principles IV, VI, VII.

[38] 1979 Principles, *supra* n. 20, Principle XIII.

[39] *Id.*

the earth by satellite and does not amount to an intolerable restriction on sensing States.[40] Furthermore, the need for such a provision is questionable in light of proposed Principle VII (2), Article XI of the Principles Treaty and Article IV of the Registration Convention, which require States to inform the Secretary-General of their space activities. As the Secretary-General makes this information public, the sensed State would have knowledge of the sensing in any event. It is reasonable to assume, however, that the "advance notification" of Principle XIII would be more particular and, more importantly, in "advance", something which is not assured under other provisions. The U.S. Working Paper of 1979 called for advance notification of remote sensing programs, to the extent feasible and practicable, to be given to the Secretary-General and the informing of other States as soon as practicable on their request.[41]

Principle XVI also touches on the right of a State to sense. It states that, "without prejudice to the principle of the freedom of exploration and use of outer space. . .remote sensing of the earth (should) (shall) be conducted with respect for the principle of full and permanent sovereignty of all States. . .over their natural resources."[42]

The right of a State to sense is also conditioned by proposed Principle XIV, which provides for consultations between the sensing and sensed State.

Thus, these appear to be few restrictions on the right of a State to conduct remote sensing of the earth and its environment under the 1979 Principles. It is to be hoped that no further limitations will be imposed.

C. The Right to Disseminate Primary Data and Analyzed Information

This issue is so explosive that the 1979 Legal Subcommittee did not even discuss it in order to avoid useless lengthy discussions. Divergent positions exist with respect to the right to disseminate primary data and analyzed information to third parties and the sensed State's right of access to the data and information. While some States favor universal dissemination, others maintain that the sensed States enjoy the exclusive right to receive the end product of the sensing process.[43] Complicating the matter is the fact that primary data and analyzed information are substantially different commodities.[44] While it may be argued that the raw data collection violates a State's sovereignty over its natural resources, it is necessary for the sensing State to process the data in order to convert it to useful information. The sensing State thus has substantial input in the analyzed information. Besides these distinctions, it is questionable whether sovereignty even extends to "information" concerning natural resources in the first place.[45] In any

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[40]Vlasic, *supra* note 11, at 570.

[41]U.N. Doc. A/AC.105/240, Annex I at 13, WG. III (1979) (W.P. 7).

[42]Note that many of the Principles are subject to a variety of different formulations.

[43]Christol, *supra* note 4, at 394.

[44]*Id.*

[45]*See* Cheng, *supra* note 2, at 605, para. 2.

event, the views of States on access to and dissemination of data and information closely parallel their views on the right to sense.

Again the better view is that of the United States, *i.e.* free dissemination of data and information. The free availability of facts advances world security and the better use of world resources. Global benefits are realized through the sharing of data and information. The aforementioned Presidential Directive of June 20, 1978 stated that "data and results from the civil space programs will be provided the widest practical dissemination to improve the condition of human beings on earth and to provide improved space services for the United States and other nations of the world". This policy is consistent with the United States Freedom of Information Act which requires that U.S. citizens have access to sensed data. The United States is opposed to the veto by individual States of the dissemination of data and information relating to their territories for a variety of reasons, including: (1) the aforementioned fact that satellites are not able to detect political boundaries; (2) the problems to which remote sensing satellites are addressed are of global, or at least regional, proportion; (3) it is unlikely that countries obtaining data could effectively operate ground stations under a restrictive dissemination system; and (4) a restrictive dissemination system would exacerbate the division between rich and poor countries and between technologically advanced and less advanced States.[46]

The 1979 Principles do provide an open regime for information relating to the preservation of the natural environment of the earth. Principle V calls for the protection of the environment and the necessity to make available information useful for the prevention of phenomena detrimental thereto. Principle VIII provides that data and/or information indicating an impending natural disaster shall be disseminated as promptly as possible to at least those States likely to be affected. There is general acceptance of both of these provisions.

Other Principles deal with data and information on a broad level. It is provided that the "data and information (shall) (should) be used by States in a manner compatible with the legitimate rights and interests of other States."[47] Also a consideration is the disputed provision calling for respect for the principle of sovereignty over wealth and natural resources, extending to the inalienable right to dispose of those resources and the information pertaining thereto.[48] Principle XIV calls for consultations between the sensing State and the sensed State in regard to the dissemination of data and information.

Besides the general principles, two conditional dissemination regimes are presented. The first accords to the sensed State timely and non-discriminatory access to data pertaining to its territory on reasonable terms. This access is to be on a continuous and priority basis and, in any case, no later than the dissemination of the data to any third State.[49] The second formulation is that States carrying out remote sensing of the

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[46]Leigh, *supra* note 30.

[47]1979 Principles, *supra* n. 20, Principle IX.

[48]1979 Principles, *supra* n. 20, Principle XVI.

[49]1979 Principles, *supra* n. 20, Principle XII.

earth shall not, without the approval of the States whose territories are affected by these activities, disseminate or dispose of any data or information on the natural resources of these States to third States, international organizations or public or private entities.[50] There is no general consensus on either of these versions.

One interesting proposal which did not find its way into the Principles was that of the U.S.S.R. which sought to classify the information acquired through remote sensing according to spatial resolutions. It suggested that there be "global," "regional" and "local" information. While global and regional information would be freely disseminated, local information, that with a resolution of 50 meters or finer, could not be distributed without the consent of the sensed State.[51] This classification, motivated by security considerations, was rejected.[52]

In summary, there is need for some legal regulation for the access of the sensed State to the data and information and of the right of the sensing State to distribute it to third parties. It can only be hoped that the limitations on an open, free system be kept to a minimum. As the social and economic benefits of open dissemination become known to those who now seek strict regulation, it is possible that many of the limitations now being suggested will have less appeal.[53] It is similar to legislating in advance for fear of some consequences that practice later shows to be unjustified, as, for example, the Concord case in New York.

III. International Cooperation

A recurring theme of the 1979 Principle is that of international cooperation, with special regard to be given to the developing countries. Both echoing and extending Article 1 of the 1967 Principles Treaty, the Principles speak of "international cooperation", the "benefit and. . .interests of all countries" and the "particular needs of the developing countries."[54] Principle IV calls on sensing States to promote international cooperation by making available to other States the opportunity to participate in their programs. States are also encouraged to consider agreements for the establishment of shared regional facilities. Principle VI advocates technical assistance. The United Nations and its agencies are also given a role to play. They should promote international cooperation, including technical assistance, and act as a coordinator of the remote sensing of the earth.[55] The United Nations is not only to be notified of remote sensing programs, but States are also encouraged to make available any relevant technical information involving possible operational systems which they are free to

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[50]1979 Principles, *supra* n. 20, Principle XV.

[51]See Christol, *supra* note 4, at 399 *et seq.*

[52]*Id.* at 417.

[53]*Id.* at 420.

[54]1979 Principles, *supra* n. 20, Principle II.

[55]1979 Principles, *supra* n. 20, Principle VII (1).

disclose.[56] Numerous other Principles call for agreement and consultation among States.[57]

Again it should be emphasized that many of these provisions are already found in other instruments of international law. It is also important to note that the transfer of technology problem and security considerations involved with the open dissemination of information will remain as obstacles to the acceptance by States of the Principles. Nevertheless, repeated and concentrated efforts to break down those barriers may prove successful in the long run.

Those States in favor of freedom of sensing and dissemination of data and information can point to the call for international cooperation as supportive of their position. Global and regional solutions to environmental and resource problems can only be achieved in a relatively open regime. Restrictions on sensing and dissemination are not easily reconciled with international cooperation. For there to be cooperation, there must be access to the information.

The U.S. LANDSAT program is an outstanding example of how a free system lends itself to international cooperation. The construction of ground stations around the world, joint participation in specific scientific programs and the wide dissemination of information are all evidence of the benefits which can be realized.[58]

In closing, it should be stressed that the emphasis on international cooperation does not preclude remote sensing by private concerns. While States are reluctant to assume international responsibility for the *ground* segment of private sensing programs (evidenced by the lack of consensus for Principle XI), such problems should be resolved in the future. The United States has already made extensive studies on the future role of government and private industry in remote sensing and how the transition to private concerns could be accomplished.[59]

In conclusion it may be stated that remote sensing is an essential space activity which should be used freely for the benefit of all. Any form of cooperation, collaboration, partnership or common exploitation as in INTELSAT should be envisaged, not limitations or restrictions. It is good behavior and friendly relations that should inspire the guidelines; political stands should not dictate the interdiction.

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[56] 1979 Principles, *supra* n. 20, Principle X.

[57] *See* 1979 Principles, *supra* n. 20, Principles XIV and XVII.

[58] *See* Christol, *supra* note 4, at 381-382.

[59] Private Sector Involvement in Civil Space Remote Sensing (PSIS), June 15, 1979. (Draft prepared by an Interagency Task Force).

I.

REPORT OF THE CHAIRMAN OF THE WORKING GROUP ON REMOTE SENSING*

1. The Sub-Committee, at the first meeting of its present session on 17 March 1981, re-established its Working Group on remote sensing.

2. The Working Group noted that the Legal Sub-Committee was required, under paragraph 5 of General Assembly resolution 35/14 of 3 November 1980, to continue as a matter of priority its detailed consideration of the legal implications of remote sensing of the earth from space, with the aim of formulating draft principles relating to remote sensing.

3. The Working Group held its 1st meeting on 17 March 1981 and concluded its work on 3 April 1981, having held a total of nine meetings. There were also informal consultations.

4. The Working Group had before it the report of the Legal Sub-Committee on its nineteenth session in 1980 which contained the report of the Chairman of the Working Group and, in the appendix to the report of the Chairman, the texts of the draft principles as they appeared at the conclusion of the nineteenth session (A/AC.105/271, annex II, appendix).

5. The Working Group noted that the subject of remote sensing was an item on the agenda of the Scientific and Technical Sub-Committee at its eighteenth session held in February 1981, and that chapter IV was the relevant section of the Scientific and Technical Sub-Committee's report on that session (A/AC.105/287).

6. The following working papers were submitted in the course of the discussions of the Working Group at its present session: a working paper submitted by the delegation of Colombia (WG/RS(1981)/WP.1) with respect to principle I and principle XV; and a working paper, entitled "Principles relating to remote sensing of the earth, its natural resources and its environment," submitted by the delegation of Mexico (WG/RS(1981)/WP.2). The working papers are included in section B of the appendix to this report.

7. As to the organization of its work, the Working Group agreed that it would, beginning with principle I, review the texts of the draft principles set out in the appendix to the report of the Chairman of the Working Group at the nineteenth session

*Taken from U.N. Comm. on the Peaceful Uses of Outer Space, Report of the Legal Sub-Committee on the Work of its Twentieth Session (16 March-10 April 1981), Doc. A/AC.105/288, Annex I, pp. 1-6 (1981).

of the Sub-Committee (A/AC.105/271, annex II, appendix)**. Principles II to X, however, in which the words "[shall] [should]" alone appeared in square brackets, would not be reviewed unless a delegation wished a particular principle considered. The views expressed in and the results of the discussions of the Working Group are summarized below.

8. *Principle I.* The suggestion was made to delete the asterisk appearing in the present text and relating to the term "analysed information." Other delegations were of the view, however, that consideration of a proposal to delete the asterisk was premature since the Working Group had not yet adequately determined the content of this term and the necessity of retaining it.

With the aim of introducing a new approach to the definitions contained in this principle, the delegation of Colombia tabled a working paper in which new definitions of the terms used in the draft principles were suggested. These new definitions, it was held, took better account of the existing distinction between "macroscopic" and "microscopic" remote sensing as well as the fact that there existed information collected by other sources than satellites. While some delegations indicated their agreement with the basic approach of the Colombian proposal inasmuch as a distinction was drawn between different types of remote sensing activities and conclusions were drawn from this distinction as to the regime for the dissemination of data, other delegations felt that the new definitions proposed by Colombia were likely to create more problems than they could solve because by introducing new concepts such as "macroscopic" and "microscopic" remote sensing and drawing certain conclusions from these concepts they attempted to encompass too much, thereby complicating matters still further. Still other delegations felt that in attempting to regulate activities which could not be considered "space activities" the Colombian proposal was going beyond the mandate of the Legal Sub-Committee. Since there was no consensus on the Colombian proposal, the present text, including the foot-notes, was retained and it was decided to attach the working paper submitted by Colombia to the report of the Chairman of the Working Group.

9. *Principles II to X.* These principles were not specifically discussed although references were made by some delegations to some of these principles in the course of the discussion of other principles.

10. *Principle XI.* It was suggested that, as a first step, brackets now appearing around this principle as a whole should be deleted and that the Working Group should then try to eliminate the remaining brackets in the text. Other delegations also stressed the importance of retaining this principle relating to the international responsibilities of States for remote sensing activities, some of these delegations indicating their preference for using the expression "shall" rather than "should." Furthermore, it was stated that this principle should also apply to the activities of non-governmental organizations. Other delegations were of the view that this principle should not go beyond what is already regulated in other legal instruments, e.g., article VI of the Outer Space Treaty of 1967, and should therefore be eliminated. To the extent that the principle went beyond

****Editor's note:* For a text of Doc. A/AC.105/271, annex II, appendix, see 8 J. Space L. 119-123 (1980).

article VI of the Outer Space Treaty of 1967, it was, in the view of those delegations, unacceptable in its present form. Reference was also made in this connexion to principle III which had been tentatively agreed upon. Since there was no consensus, the present text was retained.

11. *Principle XII.* In view of the relevance of this principle to other principles, in particular principles XIII and XV, the Group again decided to permit delegations to refer to related principles in the course of the discussion of principle XII if they so desired. Although there was agreement that sensed States should have timely and non-discriminatory access to primary data obtained from remote sensing and relating to their territory on reasonable terms, no consensus could be reached on specific language for this principle because opinions were divided as to the necessity of such terms being agreed upon between the sensing and the sensed States and as to the time element involved. Some delegations, proposing to delete the square brackets around the word "agreed," stressed the importance of reaching agreement on the practical aspects of the transfer of data without, however, such an agreement in any case obstructing access to the data by the sensed State. Other delegations, speaking in favour of deleting the term "agreed," pointed out that a requirement to reach agreement on the terms for the transfer of data could lead to the refusal of the sensing State to grant access to data and would therefore be tantamount to a right of veto. The view was expressed that, for some civil remote sensing programmes, which the principles cover, the requirement of specific agreements with the sensed States on terms of access was impracticable. In this connexion the view was expressed that the above definition of remote sensing programmes lacked precision. To advance the discussion it was then suggested to delete "agreed" from principle XII and to treat the concept underlying this term in the context of principle XV. Although the link between these two principles was recognized, the suggestion did not, however, meet with general support because of the controversial nature of principle XV. Principle XII was therefore left unchanged.

12. *Principle XIII.* Reference was made to two proposals relating to this principle submitted by the USSR and the United States, respectively, in 1979. In the course of the discussion, basically three ways of notification in connexion with remote sensing programmes became apparent: prior notification of the general nature of such programmes and their geographical coverage, notification after commencement of the programme, and giving notification that primary data had been received from such programmes. Each of the approaches mentioned received support from some delegations, some delegations also supporting various combinations of those alternatives. In the course of the debate it became evident, however, that some delegations would insist on some form of prior notification of remote sensing programmes and that other delegations could not accept such an obligation. These delegations pointed out that practical and technical circumstances might prevent States from carrying out remote sensing programmes in the exact manner described in the notification prior to the actual beginning of the remote sensing activity. Those delegations who supported prior notification pointed out, on the other hand, that such prior notification involved respect for the sovereignty of States and also would give States the opportunity to participate in the remote sensing programme so being notified and to co-operate with the sensing State. In the view of some delegations the concept of

prior notification to States, the territories of which were intended to be sensed, was also contained in the second sentence. The Working Group decided to delete the first sentence of the principle. The remaining part of this principle was left unchanged in view of the failure to achieve consensus on any specific language.

13. *Principle XIV.* There was a short discussion on this principle. Some delegations, pointing out that similar ideas were already contained in other principles, in particular principle IV, expressed the view that principle XIV could be deleted or, at least, the language at present proposed streamlined. Other delegations, while not excluding the possibility of ultimately deleting this principle, felt that it would be premature to take a decision on the deletion before other principles, in particular principle XV, had been agreed upon. It was therefore decided to retain this principle in its present form.

14. *Principle XV.* Opinions were again divided in the Working Group with regard to the contents of this principle. Some delegations felt that there should be no restrictions on the dissemination of data obtained by remote sensing of the earth by satellites or analysed information derived therefrom since a system of unrestricted dissemination would be in the best interests of all States and that prohibitions on dissemination were impractical. These delegations therefore held the view that principle XV should be excluded from the set of draft principles. Other delegations, on the other hand, felt that making the dissemination of certain data and information subject to the approval of the State whose territory was affected by the remote sensing activity was necessary, this being a corollary to the principle of the sovereignty to States. Some of these delegations, while accepting in principle the approach suggested by principle XV as at present drafted felt, however, that the concept underlying the proposal made by the delegation of the USSR in 1979, which introduced spatial resolution as a criterion to describe the types of data whose dissemination should be subject to consent, might be preferable since it used an objective criterion to define the categories of data to which the consent regime would be applicable. Some of the delegations who spoke in favour of a system of unrestricted dissemination pointed out, with regard to the Soviet proposal, that notwithstanding their objection in principle against a consent regime, spatial resolution would not provide a reliable and standard reference because of technical and practical difficulties in establishing the actual spatial resolution in each instance.

Those delegations supporting the requirement of prior consent for certain types of data further pointed out that those data which are of use or beneficial to all countries should indeed be freely disseminated but that certain data obtained through remote sensing of the territory of the State, the unrestricted dissemination of which could cause damage to that State, should only be disseminated with the consent of that State. Reference was made in this connexion by way of example to data relating to harvests or crop yields. Other delegations felt on the other hand, taking account of developments in recent years, that at present all States would benefit from a system of unrestricted dissemination of data because attempts to conceal such data could be used to manipulate the market unfairly and because in a restrictive system some States would have more data, thereby obtaining an advantage over other States which would not possess these data. Some of these delegations were of the opinion that a restrictive system would be an obstacle to international co-operation and participation in remote sensing systems. Other delegations were of the opinion that international legal

regulations of dissemination of remote sensing data was hardly a hindrance to co-operation between States in the field of remote sensing of States. Still other delegations felt that because at present only a relative small number of States had access to remote sensing data or were in a position to do their own analysis of such data, it would be to the disadvantage of those States which did not have access to data, in particular developing countries, if data pertaining to their natural resources would be freely disseminated to third States. These delegations could, however, foresee in the future, when a greater number of States would participate in remote sensing programmes, that the consent regime might be changed so as to allow unrestricted dissemination of remote sensing data. Other delegations, while considering that a wide unrestricted dissemination of data from remote sensing would be able to serve the interests of sensed States, in particular developing countries, felt that it was necessary to restrict the dissemination of certain data obtained with a resolution below a certain threshold.

The delegation of Colombia, pointing out the inadequacies which, in the view of that delegation, existed in the present text of principle XV, as well as in the proposal of the Soviet Union, tabled a working paper proposing new language for this principle. Some delegations indicated general support for the thrust of the Colombian proposal, but some of these delegations thought that the introduction of new concepts such as "agricultural crops" would create additional difficulties in the application of this principle. Other delegations felt that the proposal was unacceptable because it again provided for the consent of sensed States with regard to the dissemination of certain data. It was also suggested to replace the present text of this principle with the text proposal by Colombia. However, since there was no consensus on the proposed new text, it was decided, in accordance with past practice, to retain the present text and to attach the Colombian working paper to the report of the Chairman of the Working Group.

15. *Principle XVI.* Some delegations indicated their support for the retention of this principle which, in the opinion of these delegations, was a natural complement of other principles, in particular principles XII and XV. Other delegations, noting that the meaning of the principle was not clear and that the concept of permanent sovereignty over natural resources was being discussed in various other forums without consensus having been achieved so far, held the view that the principle should be deleted. The view was also advanced that the contents of this principle should be placed in the context of the preamble without prejudice, however, to the final acceptance of this concept. Some delegations also proposed to delete the reference in this principle to "natural and juridical persons" but other delegations felt that this reference was necessary and should be retained. Since there was no consensus it was decided to retain the principle as drafted at present.

16. *Principle XVII.* It was suggested to delete the words "of activities covered by" and replace them with the words "or interpretation of." Other delegations preferred not to restrict the application of this principle to legal disputes. It was also felt that the present text gave undue preference to only one means of dispute settlement. Finally, attention was drawn to the asterisk relating to this principle, which stated that this principle was subject to review in the light of the full set of agreed principles and a decision on the legal nature of the principles, it being felt that the present text should

be retained unchanged. Since no consensus was reached on the present text or on any alternative formulation, it was decided to leave this principle unchanged.

17. There was only a brief and preliminary exchange of views on the working paper submitted by the delegation of Mexico. Some delegations supported the working paper in principle, reserving the right however to comment in detail on the proposed principles at the next year's session of the Legal Sub-Committee.

18. The Working Group held its final meeting on 3 April 1981, when it considered and approved the report to be made by its Chairman to the Sub-Committee.

19. The texts of the draft principles as they appeared at the conclusion of the work of the Working Group are set out in section A of the appendix to this report.

II.

REPORT OF THE CHAIRMAN OF THE WORKING GROUP ON DIRECT TELEVISION BROADCAST SATELLITES*

1. The Sub-Committee, at the first meeting of its present session on 17 March 1981, re-established its Working Group on direct television broadcast satellites.

2. The Working Group noted that the Legal Sub-Committee was required, under paragraph 5 of General Assembly resolution 35/14 of 3 November 1980, to continue as a matter of priority its detailed consideration of the elaboration of draft principles governing the use by States of artificial earth satellites for direct television broadcasting.

3. The Working Group had before it the report of the Legal Sub-Committee on its nineteenth session in 1980 which contained the report of the Chairman of the Working Group, the texts of the draft principles as they appeared at the conclusion of the nineteenth session, and the working papers which were before the Working Group at the nineteenth session (A/AC.105/271, annex 1 and appendix). The working papers were the following: the "clean text" of principles submitted at the eighteenth session of the Sub-Committee by the delegations of Canada and Sweden (A/AC.105/C.2/L.117) and the working papers submitted by other delegations at the eighteenth and nineteenth sessions of the Sub-Committee with respect to particular principles, namely, a working paper submitted by the delegation of Belgium (A/AC.105/C.2/L.120) with respect to the preamble, a working paper submitted by the delegation of Iraq (WG.II(1979)WP.4) with respect to the principle on international co-operation, a working paper submitted by the delegation of the Netherlands (WG.II(1979)/WP.2/Rev. 1) with respect to the principle on State responsibility; and, with respect to the principle on consultation and agreements between States, a working paper submitted by the delegation of Colombia (WG/DBS(1980)/WP.2), a working paper submitted by the delegation of the United Kingdom (WG/DBS(1980)/WP.1),

*Taken from U.N. Comm. on the Peaceful Uses of Outer Space, Report of the Legal Sub-Committee on the Work of its Twentieth Session (16 March-10 April 1981), Doc. A/AC.105/288, Annex II, pp. 1-2 (1981).

and a working paper submitted by the delegation of the United States (A/AC.105/C.2/L.118). It was suggested that the texts which appear in the appendix to the nineteenth session's report of the Chairman of the Working Group (A/AC.105/271, annex 1** and appendix) should be appended to this report. It was so agreed and the texts are accordingly set out in the appendix to the present report. The Working Group also had before it the United Kingdom working paper concerning the World Administrative Radio Conference of 1977 which had been submitted to the Sub-Committee in 1977 (A/AC.105/196, annex IV).

4. As to the organization of its work at its present session, the Working Group decided that it would: (a) conduct its work on the basis of the texts of the draft principles as they appeared at the conclusion of the nineteenth session of the Sub-Committee (A/AC.105/271, annex 1, appendix); (b) begin with a consideration of the following texts which contained square brackets or unresolved foot-notes, namely: State responsibility; duty and right to consult; peaceful settlement of disputes; consultation and agreements between States; programme content; and unlawful/inadmissible broadcasts; (c) postpone until later its consideration of the preamble and of texts of draft principles which contained no square brackets.

5. The Working Group held preliminary discussions on the question of State responsibility and consultation and agreements between States. During the discussions views were expressed which in the main were reflected in last year's report. The remainder of the draft principles were not discussed. The Working Group decided without delay to commence informal consultations in the hope of promoting success in its work.

6. Accordingly, the Working Group adjourned its meetings to enable informal consultations open to all members of the Sub-Committee to take place.

7. Informal consultations were held in an effort to remove the remaining differences and to reach agreement on a text to be considered by Governments and the parent body. However, no consensus was reached.

8. The Working Group held its final meeting on 7 April 1981 when it considered and approved the report to be made by its Chairman to the Sub-Committee.

**Editor's note:* For a text of Doc. A/AC.105/271, annex 1, see 8 J. Space L. 188-192 (1980).

III

RESOLUTION APPROVED BY THE XXII CONFERENCE OF THE INTER-AMERICAN BAR ASSOCIATION, MARCH 14-20, 1981 QUITO, ECUADOR

Res. 3
Solar Power Satellites

WHEREAS:

There exist an ever increasing world-wide demand for energy and limited availability of conventional sources of energy, the Inter-American Bar Association.

RESOLVES

To recommend to individual members, member associations of the Inter-American Bar Association, and other organizations, that they encourage the governments of their respective countries to promote international cooperation, among other fields, in the research and development of solar power satellites.

IV

DOCUMENTS ON THE MOON AGREEMENT

APPENDIX 1—ARGENTINA: PROPOSED AGREEMENT SUBMITTED TO LEGAL SUBCOMMITTEE (COPUOS), 1970 *

ARGENTINA: DRAFT AGREEMENT ON THE PRINCIPLES GOVERNING ACTIVITIES IN THE USE OF THE NATURAL RESOURCES OF THE MOON AND OTHER CELESTIAL BODIES (A/AC.105/C.2/L.71 AND CORR.1)

The States Parties to this Agreement.

Bearing in mind that activities in the use of the natural resources of the Moon have begun,

Reaffirming that mankind has a common interest in promoting the use of outer space, including the Moon and other celestial bodies, for peaceful purposes.

Considering that the Treaty of 27 January 1967 does not establish regulations specifically for activities in the use of the natural resources of the Moon and other celestial bodies,

Believing that it is necessary to complete the provisions of that Treaty with respect to the legal system for activities in the use of such resources,

Bearing in mind the benefits to be obtained from the prompt establishment of principles for the use of the natural resources of the Moon and other celestial bodies by means of a general agreement within the framework of the 1967 Treaty,

Recalling that the use of outer space must be for the benefit and in the interests of all countries, and shall be the province of all mankind,

Have agreed on the following:

ARTICLE 1

The natural resources of the Moon and other celestial bodies shall be the common heritage of all mankind.

* Source: United Nations document A/AC.105/85, Annex II, p. 1-2.

ARTICLE 2

All substances originating in the Moon or other celestial bodies shall be regarded as natural resources.

ARTICLE 3

The legal system applicable to natural resources used in their place of origin shall be distinct from that applicable to those brought to the Earth for use.

ARTICLE 4

The benefits obtained from the use of the natural resources of the Moon and other celestial bodies shall be made available to all peoples without discrimination of any kind.

ARTICLE 5

In distributing such benefits, account shall be taken of the need to promote the attainment of higher standards of living and conditions of economic and social progress and development, pursuant to article 55a of the Charter of the United Nations, in the light of the interests and requirements of the developing countries and the rights of those undertaking these activities. (Followed by the formal provisions or final clauses on the lines of those of the Treaty of 1967 and the Agreement of 1968).

APPENDIX 2—UNION OF SOVIET SOCIALIST REPUBLICS: PROPOSED TREATY REQUEST TO THE U.N. GENERAL ASSEMBLY, JUNE 4, 1971 *

REQUEST FOR THE INCLUSION OF AN ITEM IN THE PROVISIONAL AGENDA OF THE TWENTY-SIXTH SESSION

PREPARATION OF A TREATY CONCERNING THE MOON

LETTER DATED 27 MAY 1971 FROM THE MINISTER FOR FOREIGN AFFAIRS OF THE UNION OF SOVIET SOCIALIST REPUBLICS ADDRESSED TO THE SECRETARY-GENERAL

On instructions from the Government of the Union of Soviet Socialist Republics I would request the inclusion of an item in the agenda of the twenty-sixth session of the General Assembly of the United Nations entitled "Preparation of a treaty concerning the Moon".

In recent years major new advances have been made in space research. On the basis of modern science and technology, extensive research programmes relating to the Moon are being undertaken. The missions of United States astronauts and the experiments conducted by the USSR with the help of Lunokhod-1 and other automatic devices have opened up new prospects for mankind in the exploration of the Moon. These achievements will promote the further expansion of activities by States on the Moon.

At all stages of space exploration, the Soviet Union has invariably advocated the progressive development of international law on outer space in the interests of all peoples. Establishing a solid international legal basis for the activities of States in outer space serves the cause of peace and helps to strengthen mutual understanding and co-operation among States. It will be recalled that it was the initiative of the Soviet Union which led to the conclusion of the Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies, and the Agreement on the Rescue of Astronauts, the Return of Astronauts and the Return of Objects Launched into Outer Space.

The Soviet Government is of the opinion that steps should be taken now towards the further elaboration and formulation of rules of international law to govern the activities of States on the Moon. As the Earth's only natural satellite, the Moon has an important role to play in the conquest of outer space and it

*Source: United Nations document A/8391.

should be used exclusively in the interests of peace and for the benefit of all mankind. It is essential that the activities of States on the Moon should not be allowed to become a source of international conflict and that a legal basis should be established for potential uses of the Moon. The conclusion of an appropriate international treaty would serve this purpose.

I am transmitting to you a draft Treaty concerning the Moon, which is based on generally accepted rules of international law, including the Charter of the United Nations and agreements relating to outer space concluded earlier. It contains the following basic provisions:

(1) The exploration and use of the Moon are to be carried out with due regard to the interests of present and future generations.

(2) In accordance with the principles of the Charter of the United Nations, the threat or use of force or any other hostile activities on the Moon as well as the use of the Moon to carry out such activities in relation to the Earth are prohibited.

(3) The prohibition against the installation on the Moon of nuclear weapons and other weapons of mass destruction and against any other activities involving the use of the Moon for military purposes is reaffirmed.

(4) The Moon is to be explored and used by means which ensure that any adverse changes or contamination of the lunar environment are avoided.

(5) The surface and subsoil of the Moon cannot become the property of States, international intergovernmental or non-governmental organizations, national organizations or juridical or natural persons.

(6) States Parties are to take all possible steps to safeguard the life and health of any man on the Moon.

A treaty based on the above principles would be an important contribution to the formation and development of international space law. The conclusion of such a treaty would promote the further elaboration of rules of international law relating to the activities of States in the exploration of celestial bodies.

The Government of the Union of Soviet Socialist Republics trusts that at its twenty-sixth session the General Assembly will give due attention to the item "Preparation of a treaty concerning the Moon".

Since the United Nations Committee on the Peaceful Uses of Outer Space and its Legal Sub-Committee are to hold sessions before the opening of the twenty-sixth session of the General Assembly, I would ask you to bring the Soviet draft Treaty concerning the Moon to the attention of those bodies.

I would request you, Sir, to regard this letter as an explanatory memorandum under rule 20 of the rules of procedure of the General Assembly and to circulate it, together with the text of the draft Treaty, as an official document of the United Nations.

(*Signed*) A. GROMYKO,
Minister for Foreign Affairs of the Union of Soviet Socialist Republics.

ANNEX—TREATY CONCERNING THE MOON

The States Parties to this Treaty,

Noting the gains made by States in the exploration of the Moon,

Recognizing that the Moon as the only natural satellite of the Earth, has an important role to play in the conquest of outer space,

Desiring to prevent the Moon from becoming a scene of international conflict,

Determined to promote the further development of co-operation among States in the exploration and use of the Moon and its subsoil and of circumlunar space,

Recalling the provisions of the Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies, and the provisions of the Agreement on the Rescue of Astronauts, the Return of Astronauts and the Return of Objects Launched into Outer Space,

Taking into account the need to define and develop the provisions of these international instruments in relation to the Moon with a view to further progress in the conquest of outer space,

Have agreed on the following:

ARTICLE I

1. States Parties shall pursue their activities on the Moon and in circumlunar space in accordance with international law, including the Charter of the United Nations.

2. In accordance with the principles of the Charter of the United Nations, the use of force in any form or the threat of force, as well as any other hostile actions or threat of such actions, shall be prohibited on the Moon. The use of the Moon to commit any of the aforementioned actions in relation to the Earth or space objects shall also be prohibited.

ARTICLE II

1. The Moon shall be used by all States Parties exclusively for peaceful purposes.

2. States Parties undertake not to place in orbit around the Moon any objects carrying nuclear weapons or any other kinds of weapons of mass destruction or to install such weapons on the surface of the Moon or in its subsoil.

3. The establishment of military bases, installations and fortifications, the testing of any type of weapons and the conduct of military manoeuvers on the Moon shall be prohibited.

ARTICLE III

1. States Parties shall strive to co-operate in matters relating to activities on the Moon. Such co-operation may be on either a multilateral or a bilateral basis.

2. Each State Party shall engage in the exploration and use of the Moon with due regard to the interests of present and future generations and with respect for the rights of other States Parties as specified in this Treaty.

3. A State Party which has reason to believe that another State Party is violating its obligations under this Treaty may request consultations between the States Parties concerned.

ARTICLE IV

1. States Parties shall explore and use the Moon by reasonable means avoiding the disruption of the existing balance of the lunar environment.

2. States Parties shall explore and use the Moon in such a way as to prevent adverse changes in the lunar environment and its contamination through the introduction of extralunar matter. Where necessary, consultations shall be held between the States Parties concerned.

ARTICLE V

1. States Parties may pursue their activities in the exploration and use of the Moon anywhere on the surface of the Moon, in its subsoil or in circumlunar space.

2. For these purposes States Parties may, in particular:

—land their space objects on the Moon, launch them from the Moon and place them in circumlunar orbit;

—dispose their vehicles, equipment and personnel anywhere on the surface of the Moon, in its subsoil or in circumlunar space.

Vehicles and personnel of States Parties may move freely over the surface of the Moon, in its subsoil or in circumlunar space.

3. Actions of States Parties in accordance with paragraphs 1 and 2 of this article should not interfere with the activities of other States Parties on the Moon. Where such interference may occur, the States Parties concerned shall undertake consultations.

ARTICLE VI

1. States Parties may establish both manned and unmanned stations on the Moon.

2. Stations shall be installed in such a manner that they do not impede the free access of vehicles and personnel of other States Parties pursuing activities on the Moon to all areas of the Moon, as provided for in article I of the Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies.

ARTICLE VII

1. States Parties undertake to adopt all practicable measures to safeguard the life and health of men on the Moon. For this purpose they shall regard any person on the Moon as an astronaut within the meaning of the article V of the Treaty on Principles Governing the Activities of States in the Exploration and

Use of Outer Space, including the Moon and Other Celestial Bodies, and as part of the personnel of a spacecraft within the meaning of the Agreement on the Rescue of Astronauts, the Return of Astronauts and the Return of Objects Launched into Outer Space, irrespective of the duration of the stay of such person on the Moon, the place where he is situated on the Moon, his formal membership of the crew of a spacecraft and other similar circumstances.

2. It shall be the duty of States Parties to offer shelter in their stations, vehicles, installations or other facilities to persons in distress on the Moon who are part of the personnel of other States Parties.

3. In pursuing activities on the Moon, States Parties shall take the necessary steps to exchange information on any phenomena they discover in outer space, including the Moon and othed celestial bodies, which could endanger the life or health of men on the Moon, as well as information on any signs of organic life.

ARTICLE VIII

1. Neither States, international intergovernmental or non-governmental organizations and national organizations having the status of juridical persons or not, nor natural persons, may claim the surface or subsoil of the Moon as their property. The emplacement of vehicles or equipment on the surface of the Moon or in the subsoil thereof, including the construction of installations integrally connected with the surface or subsoil of the Moon, shall not create a right of ownership over portions of the surface of subsoil of the Moon.

2. Portions of the surface or subsoil of the Moon may not be the object of concession, exchange, transfer, sale or purchase, lease, hire, gift or any other arrangements or transactions with or without compensation between States, international intergovernmental and non-governmental organizations or national organizations having the status of juridical persons or not, or of arrangements or transactions between natural persons.

ARTICLE IX

In accordance with article VIII of the Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies, States Parties shall retain owernship of articles of their property delivered to the surface of the Moon or to circumlunar space including structures, vehicles and equipment.

ARTICLE X

A State Party which learns of the crash landing, forced landing or other unintended landing on the Moon of a space object that does not belong to it, or the crash of component parts of such an object shall inform the State Party to which the space object or component parts belong, and the Secretary-General of the United Nations.

ARTICLE XI

In addition to the provisions of article VII of the Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies, a State Party shall be liable for damage resulting from its act or omission or from an act or omission of its personnel on the Moon to the property or personnel of other States Parties on the Moon, unless it is established that the damage occurred through no fault of the said State or of its personnel on the Moon.

ARTICLE XII

1. This Treaty shall be open to all States for signature. Any State which does not sign this Treaty before its entry into force in accordance with paragraph 3 of this article may accede to it at any time.

2. This Treaty shall be subject to ratification by signatory States. Instruments of ratification and instruments of accession shall be deposited with the Governments of . . . , which are hereby designated the Depositary Governments.

3. This Treaty shall enter into force upon the deposit of instruments of ratification by five Governments including the Governments designated as Depositary Governments under this Treaty.

4. For States whose instruments of ratification or accession are deposited subsequent to the entry into force of this Treaty, it shall enter into force on the date of the deposit of their instruments of ratification or accession.

5. The Depositary Governments shall promptly inform all signatory and acceding States of the date of each signature, the date of deposit of each instrument of ratification of and accession to this Treaty, the date of its entry into force and other notices.

6. This Treaty shall be registered by the Depositary Governments pursuant to Article 102 of the Charter of the United Nations.

ARTICLE XIII

Any State Party to the Treaty may propose amendments to this Treaty. Amendments shall enter into force for each State Party to the Treaty accepting the amendments upon their acceptance by a majority of the States Parties to the Treaty and thereafter for each remaining State Party to the Treaty on the date of acceptance by it.

ARTICLE XIV

Any State Party to the Treaty may give notice of its withdrawal from the Treaty one year after its entry into force by written notification to the Depositary Governments. Such withdrawal shall take effect one year from the date of receipt of this notification.

ARTICLE XV

This Treaty, of which the Chinese, English, French, Russian and Spanish texts are equally authentic, shall be deposited in the achives of the Depositary Governments. Duly certified copies of this Treaty shall be transmitted by the Depositary Governments to the Governments of the signatory and acceding States.

IN WITNESS WHEREOF the undersigned, duly authorized, have signed this Treaty.

DONE in . . . . at the cities of . . . . the . . . day of . . . one thousand nine hundred and seventy . . . .

APPENDIX 3—UNITED STATES: DRAFT PROPOSALS SUBMITTED TO LEGAL SUBCOMMITTEE, APRIL 1972*

3. UNITED STATES OF AMERICA: WORKING PAPER (A/AC.105/C.2(XI)/WORKING PAPER 1; 11 APRIL 1972)

ARTICLE I

(International law, force, hostile acts)

1. States Parties to the Treaty shall carry out their activities on the moon and other celestial bodies consistent with international law, including the Charter of the United Nations and other treaties in force.

2. States Parties shall refrain from the use or threat of force or any other hostile act or threat of hostile act on the moon and other celestial bodies except in the exercise of the inherent right of individual or collective self-defence in accordance with Article 51 of the Charter. States Parties shall not use the moon or other celestial bodies to commit any such act or to engage in any such threat in relation to the earth, the moon or other celestial bodies, spacecraft, the personnel of spacecraft or man-made space objects.

4. UNITED STATES OF AMERICA: WORKING PAPER (A/AC.105/C.2(XI)/WORKING PAPER 2; 11 APRIL 1972)

ARTICLE II

(Peaceful purposes, military prohibitions)

1. The moon and other celestial bodies shall be used by all States Parties exclusively for peaceful purposes.

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* Source: United Nations document A/AC.105/101, Annex I, p. 7–18, 18, 20.

2. States Parties shall not place in orbit around or other trajectory to or around the moon or other celestial bodies or on such bodies objects carrying nuclear weapons or any other kinds of weapons or mass destruction or install, emplant or emplace such weapons on or in the moon or other celestial bodies.

3. The establishment of military bases, installations and fortifications, the testing of any type of weapons and the conduct of military manoeuvres on the moon and other celestial bodies shall be forbidden. The use of military personnel for scientific research or for any other peaceful purposes shall not be prohibited. The use of any equipment or facility necessary for peaceful exploration and use of the moon and other celestial bodies shall also not be prohibited.

5. United States of America: Working Paper (A/AC.105/C.2(XI)/Working Paper 3; 11 April 1972)

ARTICLE III

(Freedom of scientific investigation, co-operation, exchange of personnel, reporting, scientific preserves, access, consultations)

1. There shall be freedom of scientific investigation on the moon and other celestial bodies, and States shall facilitate and encourage international co-operation in such investigation.

2. International co-operation may take place by such means as multilaterally, through international intergovernmental organizations or bilaterally.

3. States Parties shall engage in the exploration and use of the moon and other celestial bodies with due regard to the interests of present and future generations and with respect for the rights of other States Parties specified in this Treaty and other treaties in force.

4. States Parties agree on the desirability of exchanging scientific and other personnel on expeditions to or installations on the moon or other celestial bodies to the greatest extent feasible and practicable.

5. Well in advance of launching, but in any event not later than 60 days before launching, States Parties intending to conduct activities on the moon or other celestial bodies shall inform the Secretary-General of the United Nations, as well as the public and the international scientific community, of the planned time frame of launching, purposes of the mission, intended locations of the mission, orbital parameters, and prospective duration of the mission. Timely notice shall also be given of any major changes in plans for the mission, of the termination of the mission and, in due course, of the nature, conduct, locations and results of the mission. The Secretary-General of the United Nations shall disseminate such information, as well as other information transmitted to him under this Treaty, immediately and effectively.

6. If a State Party becomes aware that another State Party plans to operate simultaneously in the same area of or in the same orbit around or trajectory to or around the moon or other celestial body, it shall promptly inform the other State and the Secretary-General of the timing of and plans for its own operations.

7. States Parties undertake to report to other States Parties and to the Secretary-General on areas of the moon and other celestial bodies having special scientific interest with a view to the possible establishment in those areas of scientific preserves whose exploration and use should be subject to conditions to be agreed.

8. All stations, installations, equipment and space vehicles on the moon and other celestial bodies shall be open to representatives of other States Parties on a basis of reciprocity. Such representatives shall give reasonable advance notice of a projected visit in order that appropriate consultations may be held and that maximum precautions may be taken to assure safety and to avoid interference with normal operations in the facility to be visited.

9. A State Party which has reason to believe that another State Party is not fulfilling its obligations or is interfering with the rights of other States Parties under this Treaty may request consultations between the States Parties concerned. A State Party receiving a request for such consultations shall enter into such consultations without delay. Each State Party participating in such consultations shall seek a mutually acceptable resolution of any controversy and shall bear in mind the rights and interests of all States Parties. The Secretary-General shall be informed of the results of any such consultations. Any State Party may, at any time and without seeking the consent of other States Parties concerned, seek the assistance of the Secretary-General of the United Nations in resolving any such controversy.

6. UNITED STATES OF AMERICA: WORKING PAPER (A/AC.105/C.2(XI)/WORKING PAPER 4; 11 APRIL 1972)

ARTICLE IV

(Definitions)

As employed in this Treaty:

(i) The term "celestial body" includes all natural celestial bodies other than the Earth.

(ii) The phrase "the moon and other celestial bodies" includes orbits around or other trajectories to or around celestial bodies.

7. UNITED STATES OF AMERICA: WORKING PAPER (A/AC.105/C.2(XI)/WORKING PAPER 5; 11 APRIL 1972)

ARTICLE IV

(Non-contamination, reporting)

1. States Parties shall explore and use the Moon and other celestial bodies in a reasonable manner so as to minimize the disruption of the exisitng balance of their environments whether by introducing adverse changes in such environments, their harmful contamination through the introduction of extra-environmental matter or otherwise.

2. States Parties planning missions to the Moon and other celestial bodies shall notify the Secretary-General of measures being adopted to minimize the disruption of the existing balance of the environments of those bodies. Such reports shall include the trajectories to be flown, the distance of closest approach, and specific measures taken to control micro-organisms on and in the spacecraft.

3. States Parties shall notify the Secretary-General of plans to place radioactive material on or in orbit or other trajectory around the Moon or other celestial bodies and shall give similar notification with regard to the conditions and effects of such placement when it occurs.

8. UNITED STATES OF AMERICA: WORKING PAPER (A/AC.105/C.2(XI)/WORKING PAPER 6; 11 APRIL 1972)

ARTICLE V

(Freedom of movement)

1. States Parties may pursue their activities in the exploration and use of the Moon and other celestial bodies anywhere on the surface of such bodies, below their surface and in space around them.

2. For these purposes States Parties may, in particular:

(a) Land their space objects on the Moon and other celestial bodies, launch them from such bodies and place them in orbit around or in other trajectory to or around them;

(b) Dispose their vehicles, equipment and personnel anywhere on the surface of the Moon and other celestial bodies, below their surface and in space around them.

3. States Parties acting in accordance with paragraphs 1 and 2 of this Article shall take care to avoid interfering with the activities of other States Parties on the Moon or other celestial bodies.

9. UNITED STATES OF AMERICA: WORKING PAPER (A/AC.105/C.2(XI)/WORKING PAPER 7; 11 APRIL 1972)

ARTICLE VI

(Right to establish non-interfering stations)

1. States Parties may establish both temporary and permanent, manned and unmanned stations on the Moon and other celestial bodies. A State Party establishing a station shall limit the area used to that which is reasonably required for the needs of the station and shall, at annual intervals, inform the Secretary-General whether, and in what manner, the station continues in use.

2. States shall be installed in such a manner that they do not impede the free access of vehicles and personnel of other States Parties conducting activities on the Moon and other celestial bodies in accordance with this Treaty or the Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies.

10. UNITED STATES OF AMERICA: WORKING PAPER (A/AC.105/C.2(XI)/WORKING PAPER 8; 11 APRIL 1972)

ARTICLE VII

(Rescue, shelter, reporting)

1. States Parties shall adopt all practicable measures to safeguard the life and health of persons on the Moon and other celestial bodies. For this purpose they shall regard any person on the Moon or other celestial body as an astronaut within the meaning of the Article V of the Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celstial Bodies, and as part of the personnel of a spacecraft within the meaning of the Agreement on the Rescue of Astronauts, the Return of Astronauts and the Return of Objects Launched into Outer Space, irrespective of the duration of the stay of such person on the Moon or other celestial body, the place where such person is located, formal membership of the crew of a spacecraft or other circumstances.

2. States Parties shall offer shelter in their stations, installations, vehicles and other facilities to persons in distress on the Moon or other celestial bodies.

3. States Parties shall inform the Secretary-General, as well as the public and the international scientific community, of any indications of organic life and of any phenomena they discover in outer space, including the Moon and other celestial bodies, which could endanger human life or health.

11. UNITED STATES OF AMERICA: WORKING PAPER (A/AC.105/C.2(XI)/WORKING PAPER 9; 12 APRIL 1972)

TREATY ON THE EXPLORATION OF THE MOON AND OTHER CELESTIAL BODIES

PREAMBLE

The States Parties to this Treaty,

Noting the gains made by States in the exploration and use of the Moon and other celestial bodies,

Desiring to prevent the Moon and other celestial bodies from becoming the scene of international conflict and to promote the further development of international co-operation in their exploration and use,

Recalling the provisions of the Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies, the Agreement on the Rescue of Astronauts, Return of Astronauts and the Return of Objects Launched into Outer Space, and the Convention on International Liability for Damage Caused by Space Objects,

Taking into account the need to define and develop the provisions of these international instruments in relation to activities on the Moon and other celestial bodies with a view to further progress in the exploration and use of outer space,

Have agreed on the following:

15. UNITED STATES OF AMERICA: WORKING PAPER (A/AC.105/C.2(XI)/WORKING PAPER 12; 13 APRIL 1972)

ARTICLE VIII

(Natural resources)

1. The natural resources of the moon and other celestial bodies shall be the common heritage of all mankind.

2. States Parties may use appropriate quantities of the resources of the moon and other celestial bodies in carrying out scientific investigations in furtherance of the provisions of this Treaty, whether for supporting scientific investigation on the moon or other celestial bodies or by removing such resources to the earth for analysis or analysing them in space or on the moon or other celestial bodies.

16. UNITED STATES OF AMERICA: WORKING PAPER (A/AC.105/C.2(XI)/WORKING PAPER 12/REV. 1; 17 APRIL 1972)

ARTICLE VIII

(Natural resources)

1. The natural resources of the moon and other celestial bodies shall be the common heritage of all mankind.

2. States Parties may use appropriate quantities of the resources of the moon and other celestial bodies in carrying out scientific investigations in furtherance of the provisions of this Treaty, whether for supporting scientific investigation on the moon or other celestial bodies or by removing such resources to the earth for analysis or analysing them in space or on the moon or other celestial bodies.

3. The States Parties to this Treaty, bearing in mind the need for economic advancement and for the encouragement of investment and efficient development if utilization of the resources of the moon and other celestial bodies becomes a reality, recognize the importance of concluding agreements in this area. To this end, the Depositary Governments shall promptly convene a meeting of all States Parties with a view to negotiating arrangements for the international sharing of the benefits of such utilization when one-third of the States Parties inform the Depositary Governments that they consider that practical utilization of the resources of the moon or other celestial bodies is likely to begin within two years following or has already begun.

17. AUSTRALIA: WORKING PAPER (A/AC.105/C.2(XI)/WORKING PAPER 13; 13 APRIL 1972)

ARTICLE VIII

Proposed addition to paragraph 2 of the United States working paper 12

Add the following sentence at the conclusion of paragraph 2: "Such States shall have regard to the desirability of making some portion of resources removed to the earth for such purposes available to other interested States for similar scientific investigation."

18. UNITED STATES OF AMERICA: WORKING PAPER (A/AC.105/C.2(XI)/WORKING PAPER 14; 13 APRIL 1972)

ARTICLE IX

(Ownership of space vehicles, emergency use)

1. States Parties shall retain jurisdiction and control over their personnel, vehicles, installations and equipment on the moon and other celestial bodies. Ownership of such facilities is not affected by their presence on the moon or other celestial body or elsewhere in outer space or by their return to the earth. Such facilities or their component parts found in places other than their intended location shall, in accordance with the provisions of the Agreement on Assistance to Astronauts, the Return of Astronauts and the Return of Objects Launched into Outer Space, be returned to the State Party owning them.

2. A State Party may use the property of other States Parties on the moon or other celestial bodies in the event of an emergency involving a threat to human life and shall promptly notify the Secretary-General of such use.

19. UNITED STATES OF AMERICA: WORKING PAPER (A/AC.105/C.2(XI)/WORKING PAPER 15; 13 APRIL 1972)

ARTICLE X

(Information regarding accidents)

A State Party which learns of the crash landing, forced landing or other unintended landing on the moon or other celestial body of a space object that does not belong to it, or the crash of component parts of such an object shall inform the State Party to which the space object or component parts belong, and the Secretary-General of the United Nations.

20. UNITED STATES OF AMERICA: WORKING PAPER (A/AC.105/C.2(XI)/WORKING PAPER 16; 13 APRIL 1972)

ARTICLE XI

(Non-Governmental entities, international organizations)

1. States Parties to the Treaty shall bear international responsibility for national activities on the moon and other celestial bodies where such activities are carried on by governmental agencies or by non-governmental entities, and for assuring that national activities are carried out in conformity with the provisions set forth in the present Treaty. The activities of non-governmental entities on the moon and other celestial bodies shall require authorization and continuing supervision by the appropriate State Party.

2. With the exception of Articles——to—— references in this Treaty to States shall be deemed to apply to any international intergovernmental organization which conducts space activities if the organization declares its acceptance of the rights and obligations provided for in this Treaty and if a majority of the States members of the organization are States Parties to this Treaty and to the Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, Including the Moon and Other Celestial Bodies. States members of any such organization which are States Parties to this Treaty shall take all appropriate steps to ensure that the organization makes a declaration in accordance with the foregoing.

21. UNITED STATES OF AMERICA: WORKING PAPER (A/AC.105/C.2(XI)/WORKING PAPER 17; 13 APRIL 1972)

ARTICLE XII

(Outer space Treaty, astronaut Agreement, liability Convention)

In the event of any differences arising with regard to the interpretation or application of the provisions of this Treaty, reference shall be made where appropriate to the provisions of the Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, Including the Moon and other Celestial Bodies, the Agreement on the Rescue of Astronauts, the Return of Astronauts, and the Return of Objects Launched into Outer Space, and the Convention on International Liability for Damage Caused by Space Objects.

25. UNITED STATES OF AMERICA: WORKING PAPER (A/AC.105/C.2(XI) WORKING PAPER 21; 18 APRIL 1972)

ARTICLE . . .

(Review)

At any time after this Treaty has been in force for five years, at the request of one third of the States Parties to the Treaty and with the concurrence of the majority of the States Parties a conference of the States Parties shall be convened to review this Treaty.

* * * * * * *

27. UNITED STATES OF AMERICA: WORKING PAPER (A/AC.105/C.2(XI)/WORKING PAPER 23; 19 APRIL 1972)

The following provision replaces article III, paragraph 7 contained in A/AC.105/C.2(XI)/Working paper 3:

States Parties shall report to other States Parties and to the Secretary-General concerning areas of the Moon [and other celestial bodies] having special scientific interest in order that consideration may be given to their designation as scientific preserves for which special protective arrangements are to be agreed, without prejudice to the rights of other States Parties to this Treaty.

28. UNITED KINGDOM: WORKING PAPER (A/AC.105/C.2(XI)/WORKING PAPER 24; 20 APRIL 1972)

ARTICLE . . .

(Definitions)

Proposed addition to USA draft contained in document A/AC.105/C.2(XI)/Working paper 4

Number the existing paragraph as paragraph 1 and add the following paragraph as paragraph 2:

"This treaty does not apply to extra-terrestrial materials which reach the surface of the Earth by natural means."

3. States Parties agree on the desirability of exchanging scientific and other personnel on expeditions to or installations on the Moon [or other celestial bodies] to the greatest extent feasible and practicable.

* * * * * *

30. UNITED STATES OF AMERICA: WORKING PAPER (A/AC.105/C.2(XI)/WORKING PAPER 26; 28 APRIL 1972)

ARTICLE IX

1. States Parties shall retain ownership, jurisdiction and control over their personnel, vehicles, equipment, facilities, stations and installations on the Moon other celestial bodies],[4]

31. TEXT FORMULATED BY THE WORKING GROUP (PUOS/C.2/WG(XI)/1; 11 APRIL 1972)

ARTICLE I, PARAGRAPH 1

Activities on [in the exploration and use of] the Moon [and in circumlunar space] [and other celestial bodies] shall be carried out in accordance with international law, including the Charter of the United Nations [and the Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and other Celestial Bodies] in the interest of maintaining international peace and security and promoting international co-operation and understanding.

32. TEXT FORMULATED BY THE WORKING GROUP (PUOS/C.2/WG(XI)/2; 12 APRIL 1972)

ARTICLE I, PARAGRAPH 2

In accordance with the Charter of the United Nations, the [illegal] threat or use of force or any other hostile act or threat of hostile act on the Moon [or other celestial bodies] is prohibited. It is likewise prohibited to use the Moon [or other celestial bodies] in order to commit any such act or to engage in any such threat in relation to the earth, [the Moon] or other celestial bodies, spacecraft, the personnel of spacecraft or man-made space objects.

APPENDIX 4—DRAFT OF THE LEGAL SUBCOMMITTEE, MAY 1972 *

19. After its first reading of all the proposals the working group formulated 13 articles which were reproduced in documents PUOS/C.2/WG(XI)/1-14. The texts of 16 articles which resulted from a second reading by the working group were issued in document PUOS/C.2/WG(XI)/15. At a further meeting the working group formulated the preamble and final clauses of the draft treaty, which, together with the texts earlier formulated, were reproduced in document PUOS/C.2/WG(XI)/15/Rev. 1. Certain provisions of these articles on which agreement had not yet been reached were indicated by square brackets.

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*Source: United Nations document A/AC.105/101, p. 6–16.

20. The proposals referred to in paragraphs 16–18 and the texts referred to in paragraph 19, with the exception of the draft (PUOS/C.2/WG(XI)/15/Rev. 1) set out in paragraph 21 below, are to be found in annex I.

21. At its 190th meeting on 4 May, the Sub-Committee approved the following text (as contained in document PUOS/C.2/WG(XI)/15/Rev.1), on which work should be pursued as a matter of priority:

The States Parties to this Treaty,

Noting the achievements of States in the exploration and use of the Moon [and other celestial bodies],[4]

Recognizing that the Moon, as a natural satellite of the Earth, has an important role to play in the exploration of outer space,

Determined to promote on the basis of equality the further development of co-operation among States in the exploration and use of the Moon [and other celestial bodies],

Desiring to prevent the Moon [and other celestial bodies] from becoming an area of international conflict,

Recalling the Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies, the Agreement on the Rescue of Astronauts, the Return of Astronauts and the Return of Objects Launched into Outer Space, and the Convention on International Liability for damage caused by space objects,

Taking into account the need to define and develop the provisions of these international instruments in relation to the Moon [and other celestial bodies] having regard to further progress in the exploration and use of outer space.

Have agreed on the following:

ARTICLE I

1. [As employed in this Treaty:

(i) The term "celestial body" includes all natural celestial bodies other than the Earth.

(ii) The phrase "the Moon and other celestial bodies" includes orbits around or other trajectories to or around celestial bodies.]

2. This Treaty does not apply to extra-terrestrial materials which reach the surface of the Earth by natural means.

ARTICLE II

1. Activities on [in the exploration and use of] the Moon [and in circumlunar space] [and other celestial bodies] shall be carried out in accordance with international law, including the Charter of the United Nations in the interest of maintaining international peace and security and promoting international co-operation and understanding.

2. In accordance with the Charter of the United Nations, the threat or use of force or any other hostile act or threat of hostile act on the Moon [and other celestial bodies] is prohibited. It is likewise prohibited to use the Moon [or other celestial bodies] in order to commit any such act or to engage in any such threat in relation to the Earth, [the Moon] or other celestial bodies, spacecraft, the personnel of spacecraft or man-made space objects.

ARTICLE III

1. The Moon [and other celestial bodies] shall be used by all States Parties exclusively for peaceful purposes.

2. States Parties shall not place in orbit around or other trajectory to or around the Moon [or other celestial bodies] objects carrying nuclear weapons or any other kind of weapons of mass destruction or place or use such weapons on or in the Moon [or other celestial bodies].[5]

3. The establishment of military bases, installations and fortifications, the testing of any type of weapons and the conduct of military manoeuvres on the Moon [and other celestial bodies] shall be forbidden. The use of military personnel for scientific research or for any other peaceful purposes shall not be prohibited. The use of any equipment or facility necessary for peaceful exploration and use of the Moon [and other celestial bodies] shall also not be prohibited.

[4] A suggestion was made that, with a view to deleting references to "other celestial bodies" the treaty might contain a provision along the following lines: The provisions of this Treaty shall apply to celestial bodies in addition to the Moon until such time as provision is made by other treaties in relation to specific celestial bodies. To the extent that provision is so made, this Treaty shall then cease to apply to those bodies.

[5] Certain delegations reserved their position on this paragraph.

ARTICLE IV

1. The exploration and use of the Moon [and other celestial bodies] shall be the province of all mankind and [the exploitation of their natural resources] shall be carried out for the benefit and in the interests of all countries, irrespective of their degree of economic or scientific development. Due regard shall be paid to the interests of present and future generations as well as to the need to promote higher standards of living conditions of economic and social progress and development in accordance with the Charter of the United Nations.[6]

2. States Parties shall be guided by the principle of co-operation and mutual assistance in all their activities concerning the exploration and use of the Moon [and other celestial bodies]. International co-operation in pursuance of this Treaty should be as wide as possible and may take place on a multilateral basis, on a bilateral basis, or through international intergovernmental organizations.

3. States Parties shall inform the Secretary-General as well as the public and international scientific community, to the greatest extent feasible and practicable, of their activities concerned with the exploration and use of the Moon [and other celestial bodies]. They shall in any case give information on the time, purposes, locations, orbital parameters, duration and results of each [completed] mission to the Moon [and oher celestial bodies], in particular on the scientific results arising out of such missions. In case of a mission lasting more than 60 days, information on conduct of the mission shall be given periodically at 30 days' intervals. For missions lasting more than six months, only significant additions to such information need be reported thereafter.[7]

4. If a State Party becomes aware that another State Party plans to operate simultaneously in the same area of or in the same orbit around or trajectory to or around the Moon or other celestial body, it shall promptly inform the other State of the timing of and plans for its own operations.

ARTICLE V

1. There shall be freedom of scientific investigation on the Moon [and other celestial bodies] by all States Parties without discrimination of any kind, on the basis of equality and in accordance with international law.

2. In carrying out scientific investigations in furtherance of the provisions of this Treaty the States Parties shall have the right to collect on and remove from the Moon [and other celestial bodies] samples of its [their] mineral and other substances. Such samples shall remain at the disposal of those States Parties which caused them to be collected and may be used by them for scientific purposes. States Parties shall have regard to the desirability of making a portion of such samples available to other interested States Parties and the international scientific community for scientific investigation. States Parties may in the course of scientific investigations also use mineral and other substances of the Moon [and other celestial bodies] in quantities appropriate for the support of their missions.

3. States Parties agree on the desirability of exchanging scientific and other personnel on expeditions to or installations on the Moon [or other celestial bodies] to the greatest extent feasible and practicable.

ARTICLE VI

1. In exploring and using the Moon [and circumlunar space] [and other celestial bodies] States Parties shall take measures to prevent the disruption of the existing balance of [its] [their] environment[s] whether by introducing adverse changes in such environment[s] [its] [their] harmful contamination through the introduction of extra-environmental matter or otherwise. States Parties shall also take measures to prevent harmfully affecting the environment of the Earth through the introduction of extra-terrestrial matter or otherwise.

2. [States Parties planning missions to the Moon [and other celestial bodies] shall notify the Secretary-General of measures being adopted to minimize the disruption of the existing balance of the environment[s] of [those bodies]. Such reports shall include the trajectories to be flown the distance of closest approach, and specific measures taken to control micro-organisms on and in the spacecraft.]

[6] The eventual placement of this paragraph will be decided later.

[7] Certain delegations reserved their position with respect to the question of advance notification of missions to celestial bodies.

3. [States Parties shall notify the Secretary-General of plans to place radioactive material on or in orbit or other trajectory around the Moon [or other celestial bodies] and shall give similar notification with regard to the conditions and effects of such placement when it occurs.]

4. States Parties shall report to other States Parties and to the Secretary-General concerning areas of the Moon [and other celestial bodies] having special scientific interest in order that consideration may be given to their designation as international scientific preserves for which special protective arrangements are to be agreed, without prejudice to the rights of other States Parties to this Treaty.

ARTICLE VII

1. States Parties may pursue their activities in the exploration and use of the Moon [and other celestial bodies] anywhere on or below its [their] surface, [and in circumlunar space], subject to the other provisions of this Treaty.

2. For these purposes States Parties may, in particular:

(a) land their space objects on the Moon [and other celestial bodies], and launch them from the Moon [such bodies], [and place them in circumlunar orbit];

(b) place their personnel, space vehicles, equipment, facilities, stations and installations anywhere on or below the surface of the Moon [and other celestial bodies] [and in circumlunar space];

Personnel, space vehicles, equipment, facilities, stations and installations may move or be moved freely over or below the surface of the Moon [and other celestial bodies] [and in circumlunar space].

3. Activities of States Parties in accordance with paragraphs 1 and 2 of this article shall not interfere with the activities of other States Parties on the Moon [and other celestial bodies]. Where such interference may occur, the States Parties concerned shall undertake consultations in accordance with article XVI.

ARTICLE VIII

1. States Parties may establish manned and unmanned stations on the Moon [and other celestial bodies]. A State Party establishing a station shall use only that area which is required for the needs of the station and shall immediately inform the Secretary-General of the location and purposes of that station. Subsequently, at annual intervals that State shall likewise inform the Secretary-General whether the station continues in use and whether its purposes have changed.

2. Stations shall be installed in such a manner that they do not impede the free access to all areas of the Moon of personnel, vehicles and equipment of other States Parties conducting activities on the Moon [and other celestial bodies] in accordance with the provisions of this Treaty or of article I of the Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and other Celestial Bodies.

ARTICLE IX

1. States Parties shall adopt all practicable measures to safeguard the life and health of persons on the Moon [and other celestial bodies]. For this purpose they shall regard any person on the Moon [or other celestial body] as an astronaut within the meaning of the article V of the Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies and as part of the personnel of a spacecraft within the meaning of the Agreement on the Rescue of Astronauts, the Return of Astronauts and the Return of Objects Launched into Outer Space.

2. States Parties shall offer shelter in their stations, installations, vehicles and other facilities to persons in distress on the Moon [or other celestial bodies].

3. States Parties shall inform the Secretary-General, as well as the public and the international scientific community, of any phenomena they discover in outer space, including the Moon and other celestial bodies, which could endanger human life or health, as well as any indication of organic life.

ARTICLE X[6]

1. [The natural resources of the Moon [and other celestial bodies] shall be the common heritage of all mankind.]

2. Neither States, international intergovernmental or non-governmental organizations, national organizations having the status of juridical persons or not, nor natural persons, may claim the surface or subsurface of the Moon [or other celestial bodies] as their property. The placement of personnel, space vehicles, equipment, facilities, stations and installations on or below the surface of the Moon [or other celestial bodies] including structures connected with its [their] surface or subsurface, shall not create a right of ownership over parts of the surface or subsurface of the Moon [or other celestial bodies].

3. [Parts of the surface or subsurface of the Moon [or other celestial bodies] may not be the object of grant, exchange, transfer, sale or purchase lease, hire, gift or any other arrangement or transactions with or without compensation between States, international intergovernmental and non-governmental organizations or national organizations having the status of juridical persons or not, or of arrangements or transactions between natural persons.]

4. [The States Parties to this Treaty, bearing in mind the need for economic advancement and for the encouragement of investment and efficient development if utilization of the resources of the Moon and other celestial bodies becomes a reailty, recognize the importance of concluding agreements in this area. To this end, the Depositary Governments shall promptly convene a meeting of all States Parties with a view to negotiating arrangements for the international sharing of the benefits of such utilization when one third of the States Parties inform the Depositary Governments that they consider that practical utilization of the resources of the Moon or other celestial bodies is likely to begin within two years following or has already begun.]

ARTICLE XI

1. States Parties shall retain jurisdiction and control over their personnel, vehicles, equipment, facilities, stations and installations on the Moon [and other celestial bodies]. The ownership of space vehicles, equipment, facilities, stations and installations shall not be affected by their presence on the Moon [or other celestial bodies].[8]

2. Vehicles, installations and equipment or their component parts found in places other than their intended location shall be dealt with in accordance with article V of the Agreement on Assistance to Astronauts, the Return of Astronauts and the Return of Objects Launched into Outer Space.

3. In the event of an emergency involving a threat to human life, States Parties may use the equipment, vehicles, installations, facilities or supplies of other States Parties on the Moon [or in circumlunar space] [or other celestial bodies]. Prompt notification of such use shall be made to the Secretary-General or State Party concerned.

ARTICLE XII

A State Party which learns of the crash landing, forced landing or other unintended landing on the Moon [or other celestial body] of a space object, or its component parts, that were not launched by it, shall promptly inform the launching State Party and the Secretary-General of the United Nations.

ARTICLE XIII

1. States Parties to this Treaty shall bear international responsibility for national activities on the Moon [and other celestial bodies] whether such activities are carried on by governmental agencies or by non-governmental entities, and for assuring that national activities, are carried out in conformity with the provisions set forth in the present Treaty. States Parties shall ensure that non-governmental entities under their jurisdiction shall engage in activities on the Moon [and other celestial bodies] only under the authority and continuing supervision of the appropriate State Party.

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[8] This text may be supplemented later.

[9] Certain delegations reserved their positions on the reference to property, with regard to facilities, stations, and installations.

2. [In addition to the provisions of article VII of the Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies, a State Party shall be liable for damage resulting from its act or omission or from an act or omission of its personnel on the Moon to the property or personnel of other States Parties on the Moon, unless it is established that the damage occurred through no fault of the said State or of its personnel on the Moon.]

ARTICLE XIV

With the exception of Articles XVIII to XXI, references in this Treaty to States shall be deemed to apply to any international intergovernmental organization which conducts space activities if the organization declares its acceptance of the rights and obligations provided for in this Treaty and if a majority of the States members of the organization are States Parties to this Treaty and to the Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, Including the Moon and Other Celestial Bodies. States members of any such organization which are States Parties to this Treaty shall take all appropriate steps to ensure that the organization makes a declaration in accordance with the foregoing.

ARTICLE XV

In the event of any difference arising between States Parties with regard to the interpretation [or application] of the provisions of this Treaty, reference shall be made where appropriate to the provisions of the Treaty on the Principles Governing the Activities of States in the Exploration and Use of Outer Space, Including the Moon and other Celestial Bodies, the Agreement on the Rescue of Astronauts, the Return of Astronauts, and the Return of Objects Launched into Outer Space, and the Convention on International Liability for Damage caused by Space Objects.[10]

ARTICLE XVI

1. Each State Party may assure itself that the activities of other States Parties in the exploration and use of the Moon [and other celestial bodies] are compatible with the provisions of this Treaty. To this end, all space vehicles, equipment, facilities, stations and installations on the Moon [and other celestial bodies] shall be open to other States Parties. Such States Parties shall give reasonable advance notice of a projected visit, in order that appropriate consultations may be held and that maximum precautions may be taken to assure safety and to avoid interference with normal operations in the facility to be visited. In pursuance of this Article, any State Party may use its own means, or may act with the full or partial assistance of any other State Party, or through appropriate international procedures within the framework of the United Nations and in accordance with the Charter.

2. A State Party which has reason to believe that another State Party is not fulfilling the obligations incumbent upon it pursuant to this Treaty or that another State Party is interfering with the rights which the former State has under this Treaty may request consultations with that Party. A State Party receiving such a request shall enter into such consultations without delay. Any other State Party which requests to do so shall be entitled to take part in the consultations. Each State Party participating in such consultations shall seek a mutually acceptable resolution of any controversy and shall bear in mind the rights and interests of all States Parties. The Secretary-General shall be informed of the results of the consultations and transmit the information received to all States Parties concerned.

3. If the consultations do not lead to a mutually acceptable settlement which has due regard for the rights and interests of all the States Parties, the parties concerned shall take all measures to settle the dispute by other peaceful means of their choice and appropriate to the circumstances and the nature of the dispute. If difficulties arise in connexion with the opening of consultations or if consultations do not lead to a mutually acceptable settlement, any State Party may seek the assistance of the Secretary-General without seeking the consent of any other State Party concerned, in order to resolve the controversy. A State Party which does not maintain diplomatic relations with another State Party concerned shall participate in such consultations, at its choice, either itself or through another State Party or the Secretary-General, as intermediary.

[10] The delegation of Australia reserved its position on this article.

ARTICLE XVII

At any time after this Treaty has been in force for five years, at the request of one third of the States Parties to the Treaty and with the concurrence of the majority of the States Parties a conference of the States Parties shall be convened to review this Treaty.

ARTICLE XVIII

1. This Treaty shall be open to all States for signature. Any State which does not sign this Treaty before its entry into force in accordance with paragraph 3 of this article may accede to it at any time.

2. This Treaty shall be subject to ratification by signatory States. Instruments of ratification and instruments of accession shall be deposited with the Governments of . . .. which are hereby designated the Depositary Governments.

3. This Treaty shall enter into force upon the deposit of instruments of ratification by five Governments including the Governments designated as Depositary Governments under this Treaty.

4. For States whose instruments of ratification or accession are deposited subsequent to the entry into force of this Treaty, it shall enter into force on the date of the deposit of their instruments of ratification or accession.

5. The Depositary Governments shall promptly inform all signatory and acceding States of the date of each signature, the date of deposit of each instrument of ratification of and accession to this Treaty, the date of its entry into force and other notices.

6. This Treaty shall be registered by the Depositary Governments pursuant to Article 102 of the Charter of the United Nations.

ARTICLE XIX

Any State Party to the Treaty may propose amendments to this Treaty. Amendments shall enter into force for each State Party to the Treaty accepting the amendments upon their acceptance by a majority of the States Parties to the Treaty and thereafter for each remaining State Party to the Treaty on the date of acceptance by it.

ARTICLE XX

Any State Party to the Treaty may give notice of its withdrawal from the Treaty one year after its entry into force by written notification to the Depositary Governments. Such withdrawal shall take effect one year from the date of receipt of this notification.

ARTICLE XXI

This Treaty, of which the Chinese, English, French, Russian and Spanish texts are equally authentic, shall be deposited in the archives of the Depositary Governments. Duly certified copies of this Treaty shall be transmitted by the Depositary Governments to the Governments of the signatory and acceding States.

IN WITNESS WHEREOF the undersigned, duly authorized, have signed this Treaty.

DONE in . . ., at the cities of . . ., the . . . day of . . one thousand nine hundred and seventy. . . .

APPENDIX 5—UNITED STATES PROPOSALS, 1973*

(12) UNITED STATES OF AMERICA: WORKING PAPER (30 MARCH 1973)

DRAFT TREATY RELATING TO THE MOON

(A/AC.105/101, paragraph 21)

1. The provisions of this Treaty shall apply to the moon, planets, and other celestial bodies within the solar system, other than the earth, unless expressly stated, as well as to orbits around the moon, planets or such other celestial bodies.

* Source: United Nations document A/AC.105/115, Annex I, p. 32–34.

2. This Treaty does not apply to extra-terrestrial materials which reach the surface of the earth by natural means.

3. The term "other celestial bodies" as employed in this Treaty shall apply to all natural celestial bodies of the solar system, other than the earth, moon and planets.

(13) UNITED STATES OF AMERICA: WORKING PAPER (9 APRIL 1973)

DRAFT TREATY RELATING TO THE MOON

(A/AC.105/101, paragraph 21)

References in this Treaty to "other celestial bodies" shall be deemed to apply to the planets and other celestial bodies within the solar system, except the earth, as well as to orbits and other transit trajectories to or around those bodies. The States parties to the Treaty agree that, should it become desirable at some later stage to elaborate additional arrangements in regard to the exploration and use of individual planets or other celestial bodies within the solar system, a conference of States parties shall be convened for that purpose by the depositary Governments when one third of the States parties so request.

(14) UNITED STATES OF AMERICA: WORKING PAPER (17 APRIL 1973)

DRAFT TREATY RELATING TO THE MOON

The United States advances the following proposal for the purpose of reaching agreement on a mutually acceptable formulation of article X, concerning the natural resources of the moon and other celestial bodies.

ARTICLE X

"1. The moon and other celestial bodies are not subject to national appropriation by any claim of sovereignty, by means of use or occupation, or by any other means.

"2. Neither the surface nor the subsurface of the moon or other celestial bodies, nor any area thereof or natural resources in place, shall become the property of any State, international intergovernmental or non-governmental organization, national organization or non-govermental entity or of any natural person. The placement of personnel, space vehicles, equipment, facilities, stations and installations on or below the surface of the moon or other celestial bodies, including structures connected with their surface or subsurface, shall not create a right of ownership over the surface or the subsurface of the moon or other celestial bodies or any areas thereof. The foregoing provisions are without prejudice to the international régime referred to in paragraph 4 of this article, as well as to exploitation of the natural resources of the moon or other celestial bodies pending the establishment of such a régime.

"3. States Parties have an equal right to the exploration and use of the moon and other celestial bodies without discrimination of any kind under the conditions stipulated in this treaty.

"4. States Parties undertake to establish an international régime governing the exploitation of the natural resources of the moon and other celestial bodies, including appropriate procedures, when such exploitation becomes feasible.

"5. The main purposes of the international régime to be established shall be to ensure the orderly and safe development and rational management of the natural resources of the moon and other celestial bodies, to expand opportunities in the use thereof and to determine an equitable sharing by all States Parties in the benefits derived therefrom, taking into consideration, in particular, the interests and needs of the developing countries.

"6. A conference of all States Parties shall be convened by the depositary governments at the request of one third of such States in order to implement the provisions of paragraph 4 of this article on the basis of principle that the natural resources of the moon and other celestial bodies are the common heritage of mankind, due regard being paid to the provisions of article V of this treaty.

"7. All activities with respect to the natural resources of the moon or other celestial bodies shall be carried out in a manner compatible with the purposes of the international régime to be established as specified in paragraph 5 of this article."

In addition, the United States would accept the proposal to add an obligation to furnish information not only on scientific results of missions but also on natural resources found on the moon or other celestial bodies. As revised accordingly, article IV, paragraph 3 of the draft treaty would read:

"3. States Parties shall inform the Secretary-General as well as the public and the international scientific community, to the greatest extent feasible and practicable, of their activities concerned with the exploration and use of the moon and other celestial bodies. They shall in any case give information on the time, purposes, locations, orbital parameters, duration and results of each mission to the moon and other celestial bodies, and in particular information regarding scientific results *and natural resources* arising out of such missions. In case of a mission lasting more than 60 days, information on conduct of the mission shall be given periodically at 30-day intervals. For missions lasting more than six months, only significant additions to such information need be reported thereafter." [1]

[1] The question of advance notification of missions is reserved.

APPENDIX 6—WORKING GROUP REVISIONS 1973*

17. The Working Group, after consideration approved the texts of six provisions which are reproduced below.

ARTICLE II, PARAGRAPH 1

All activities on the moon including its exploration and use, shall be carried out in accordance with international law, in particular, the Charter of the United Nations, and taking into account the Declaration on Principles of International Law concerning Friendly Relations and Co-operation among States in accordance with the Charter of the United Nations, adopted by the General Assembly on 24 October 1970, in the interest of maintaining international peace and security and promoting international co-operation and mutual understanding, and with due regard to the corresponding interests of all other States Parties.

ARTICLE IV, PARAGRAPH 3

States Parties shall inform the Secretary-General as well as the public and the international scientific community, to the greatest extent feasible and practicable, of their activities concerned with the exploration and use of the moon. Information on the time, purposes, locations, orbital parameters and duration shall be given in respect of each mission to the moon, while information on the results of each mission, including scientific results, shall be furnished upon completion of the mission. In case of a mission lasting more than 60 days, information on conduct of the mission shall be given periodically at 30 days' intervals. For missions lasting more than six months, only significant additions to such information need be reported thereafter (points of time of information to the Secretary-General to be resolved).

ARTICLE VI

1. In 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 such environment, its harmful contamination through the introduction of extra-environmental matter or otherwise. States Parties shall also take measures to prevent harmfully affecting the environment of the earth through the introduction of extra-terrestrial matter or otherwise.

2. States Parties shall inform the Secretary-General of the measures being adopted by them in accordance with paragraph 1 of this article and shall also notify him of all placements by them of radioactive materials on the moon and of the purposes of such placements. (Points of time of information and notification to the Secretary-General to be resolved.)

* * * * * * *

*Source: United Nations document A/AC.105/115, p. 5–7.

4. States Parties shall report to other States Parties and to the Secretary-General concerning areas of the moon having special scientific interest in order that, without prejudice to the rights of other States Parties, consideration may be given to the designation of such areas as international scientific preserves for which special protective arrangements are to be agreed in consultation with the competent organs of the United Nations.

ARTICLE IX, PARAGRAPH 3

States Parties shall immediately inform the Secretary-General, as well as the public and the international scientific community, of any phenomena they discover in outer space, including the moon and other celestial bodies, which could endanger human life or health, as well as any indication of organic life.

ARTICLE XIII, PARAGRAPH 2

States Parties recognize that detailed arrangements concerning liability for damage sustained on the moon, in addition to the provisions of the Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies and the Convention on International Liability for Damage Caused by Space Objects, may become necessary as a result of more extensive activities on the moon, and agree that a conference of States Parties to this Treaty for the purpose of elaborating such arrangements shall be convened by the Depositary Governments when one third of the States Parties so request.

The Working Group also agreed to delete article XV of the text approved by the Legal Sub-Committee in 1972.

18. The Working Group considered the text relating to article X worked out originally in informal consultations but did not reach agreement on it. This text if [sic] reproduced in annex I(C).

19. At the 205th meeting of the Sub-Committee, the Chairman reported, in his capacity as Chairman of Working Group I, on the work of that Group. The Sub-Committee took note of the texts set out in paragraph 17 above, and recommended that the Committee on the Peaceful Uses of Outer Space should make its best efforts to complete the treaty relating to the moon at its next session in June 1973 in order that the draft treaty may be submitted to the twenty-eighth session of the General Assembly for adoption.

APPENDIX 7—AUSTRIA: WORKING PAPER, APRIL 1978 *

AGREEMENT GOVERNING THE ACTIVITIES OF STATES ON THE MOON AND OTHER CELESTIAL BODIES

The States Parties to this Agreement

Noting the achievements of States in the exploration and use of the moon and other celestial bodies,

Recognizing that the moon, as a natural satellite of the earth, has an important role to play in the exploration of outer space,

Determined to promote on the basis of equality the further development of co-operation among States in the exploration and use of the moon and other celestial bodies,

Desiring to prevent the moon from becoming an area of international conflict,

Bearing in mind the benefits which may be derived from the exploitation of the natural resources of the moon and other celestial bodies,

Recalling the Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies, the Agreement on the Rescue of Astronauts, the Return of Astronauts and the Return of Objects Launched into Outer Space, the Convention on International Liability for Damage Caused by Space Objects, and the Convention on Registration of Objects Launched into Outer Space,

Taking into account the need to define and develop the provisions of these international instruments in relation to the moon and other celestial bodies, having regard to further progress in the exploration and use of outer space,

Have agreed on the following:

*Source: United Nations document A/AC.105/218, Annex I, p. 2-10.

ARTICLE I

1. The provisions of this Agreement relating to the moon shall also apply to other celestial bodies within the solar system, other than the earth, except in so far as specific legal norms enter into force with respect to any of these celestial bodies.

2. For the purposes of the Agreement reference to the moon shall include orbits around or other trajectories to or around it.

3. This Agreement does not apply to extra-terrestrial materials which reach the surface of the earth by natural means.

ARTICLE II

All activities on the moon including its exploration and use, shall be carried out in accordance with international law, in particular, the Charter of the United Nations, and taking into account the Declaration on Principles of International Law concerning Friendly Relations and Co-operation among States in accordance with the Charter of the United Nations, adopted by the General Assembly on 24 October 1970, in the interest of maintaining international peace and security and promoting international cooperation and mutual understanding, and with due regard to the corresponding interests of all other States Parties.

ARTICLE III

1. The moon shall be used by all States Parties exclusively for peaceful purposes.

2. Any threat or use of force or any other hostile act or threat of hostile act on the moon is prohibited. It is likewise prohibited to use the moon in order to commit any such act or to engage in any such threat in relation to the earth, the moon, spacecraft, the personnel of spacecraft or man-made space objects.

3. States Parties shall not place in orbit around or other trajectory to or around the moon objects carrying nuclear weapons or any other kinds of weapons of mass detruction or place or use such weapons on or in the moon.

4. The establishment of military bases, installations and fortifications, the testing of any type of weapons and the conduct of military manoeuvres on the moon shall be forbidden. The use of military personnel for scientific research or for any other peaceful purposes shall not be prohibited. The use of any equipment or facility necessary for peaceful exploration and use of the moon shall also not be prohibited.

ARTICLE IV

1. The exploration and use of the moon shall be the province of all mankind and shall be carried out for the benefit and in the interests of all countries, irrespective of their degree of economic or scientific development. Due regard shall be paid to the interests of present and future generations as well as to the need to promote higher standards of living conditions of economic and social progress and development in accordance with the Charter of the United Nations.

2. States Parties shall be guided by the principles of co-operation and mutual assistance in all their activities concerning the exploration and use of the moon. International co-operation in pursuance of this Agreement should be as wide as possible and may take place on a multilateral basis, on a bilateral basis, or through international intergovernmental organizations.

ARTICLE V

1. States Parties shall inform the Secretary-General of the United Nations as well as the public and the international scientific community, to the greatest extent feasible and practicable, of their activities concerned with the exploration and use of the moon. Information on the time, purposes, locations, orbital parameters and duration shall be given in respect of each mission to the moon as soon as possible after launching, while information on the results of each mission, including scientific results, shall be furnished upon completion of the mission. In case of a mission lasting more than 60 days, information on conduct of the mission including any scientific results shall be given periodically at 30 days' intervals. For missions lasting more than six months, only significant additions to such information need be reported thereafter.

2. If a State Party becomes aware that another State party plans to operate simultaneously in the same area of or in the same orbit around or trajectory to or around the moon, it shall promptly inform the other State of the timing of and plans for its own operations.

3. In carrying out activities under this Agreement, States Parties shall promptly inform the Secretary-General, as well as the public and the international scientific community, of any phenomena they discover in outer space, including the moon, which could endanger human life or health, as well as of any indication of organic life.

ARTICLE VI

1. There shall be freedom of scientific investigation on the moon by all States Parties without discrimination of any kind, on the basis of equality and in accordance with international law.

2. In carrying out scientific investigations in furtherance of the provisions of this Agreement the States Parties shall have the right to collect on and remove from the moon samples of its mineral and other substances. Such samples shall remain at the disposal of those States Parties which caused them to be collected and may be used by them for scientific purposes. States Parties shall have regard to the desirability of making a portion of such samples available to other interested States Parties and the international scientific community for scientific investigation. States Parties may in the course of scientific investigations also use mineral and other substances of the moon in quantities appropriate for the support of their missions.

3. States Parties agree on the desirability of exchanging scientific and other personnel on expeditions to or installations on the moon to the greatest extent feasible and practicable.

ARTICLE VII

1. In 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 such environment, its harmful contamination through the introduction of extra-environmental matter or otherwise. States Parties shall also take measures to prevent harmfully affecting the environment of the earth through the introduction of extra-terrestrial matter or otherwise.

2. States Parties shall inform the Secretary-General of the United Nations of the measures being adopted by them in accordance with paragraph 1 of this article and shall also to the maximum extent feasible notify him in advance of all placements by them of radioactive materials on the moon and of the purposes of such placements.

3. States Parties shall report to other States Parties and to the Secretary-General concerning areas of the moon having special scientific interest in order that, without prejudice to the rights of other States Parties, consideration may be given to the designation of such areas as international scientific preserves for which special protective arrangements are to be agreed in consultation with the competent organs of the United Nations.

ARTICLE VIII

1. States Parties may pursue their activities in the exploration and use of the moon anywhere on or below its surface, subject to the provisions of this Agreement.

2. For these purposes States Parties may, in particular:

(a) Land their space objects on the moon and launch them from the moon;

(b) Place their personnel, space vehicles, equipment, facilities, stations and installations anywhere on or below the surface of the moon.

Personnel, space vehicles, equipment, facilities, stations and installations may move or be moved freely over or below the surface of the moon.

3. Activities of States Parties in accordance with paragraphs 1 and 2 of this article shall not interfere with the activities of other States Parties on the moon. Where such interference may occur, the States Parties concerned shall undertake consultations in accordance with article XV, paragraphs 2 and 3.

ARTICLE IX

1. States Parties may establish manned and unmanned stations on the moon. A State Party establishing a station shall use only that area which is required for the needs of the station and shall immediately inform the Secretary-General of the United Nations of the location and purposes of that station. Subsequently, at annual intervals that State shall likewise inform the Secretary-General whether the station continues in use and whether its purposes have changed.

2. Stations shall be installed in such a manner that they do not impede the free access to all areas of the moon of personnel, vehicles and equipment of other

States Parties conducting activities on the moon in accordance with the provisions of this Agreement or of article I of the Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and other Celestial Bodies.

ARTICLE X

1. States Parties shall adopt all practicable measure to safeguard the life and health of persons on the moon. For this purpose they shall regard any person on the moon as an astronaut within the meaning of article V of the Treaty on Principles Governing the Activities of States on the Exploration and Use of Outer Space, including the Moon and other Celestial Bodies and as part of the personnel of a spacecraft within the meaning of the Agreement on the Rescue of Astronauts, the Return of Astronauts and the Return of Objects Launched into Outer Space.

2. States Parties shall offer shelter in their stations, installations, vehicles and other facilities to persons in distress on the moon.

ARTICLE XI

1. For the purpose of this Agreement, the moon and its natural resources shall be considered the common heritage of mankind, which finds its expression in the relevant provisions of this Agreement and in particular in paragraph 5 of this article.

2. The moon is not subject to national appropriation by any claim of sovereignty, by means of use or occupation, or by any other means.

3. Neither the surface nor the subsurface of the moon, nor any part thereof or natural resources in place, shall become property of any State, international intergovernmental or non-governmental organization, national organization or non-governmental entity or of any natural person. The placement of personnel, space vehicles, equipment facilities, stations and installations on or below the surface of the moon, including structures connected with their surface or subsurface, shall not create a right of ownership over the surface or the subsurface of the moon or any areas thereof. The foregoing provisions are without prejudice to the international régime referred to in paragraph 5 of this article.

4. States Parties have the right to exploration and use of the moon without discrimination of any kind on a basis of equality, and in accordance with international law and the terms of this Agreement.

5. States Parties to this Agreement hereby undertake to establish an international régime, including appropriate procedures, to govern the exploitation of the natural resources of the moon as such exploitation is about to become feasible. This provision shall be implemented in accordance with article XVIII of this Agreement.

6. In order to facilitate the establishment of the international régime referred to in paragraph 5 of this article, States Parties shall inform the Secretary-General of the United Nations as well as the public and the international scientific community to the greatest extent feasible and practicable of any natural resources they may discover on the moon.

7. The main purposes of the international régime to be established shall include:

(a) The orderly and safe development of the natural resources of the moon;

(b) The rational management of those resources;

(c) The expansion of opportunities in the use of those resources; and

(d) An equitable sharing by all States Parties in the benefits derived from those resources,

whereby the interests and needs of the developing countries as well as the efforts of those countries which have contributed to the exploration of the moon shall be given special consideration.

8. All the activities with respect to the natural resources of the moon shall be carried out in a manner compatible with the purposes specified in paragraph 7 of this article and the provisions of article VI, paragraph 2, of this Agreement.

ARTICLE XII

1. States Parties shall retain jurisdiction and control over their personnel, vehicles, equipment, facilities, stations and installations on the moon. The ownership of space vehicles, equipment, facilities, stations and installations shall not be affected by their presence on the moon.

2. Vehicles, installations and equipment or their component parts found in places other than their intended location shall be dealt with in accordance with article V of the Agreement on Assistance to Astronauts, the Return of Astronauts and the Return of Objects Launched into Outer Space.

3. In the event of an emergency involving a threat to human life, States Parties may use the equipment, vehicles, installations, facilities or supplies of other States Parties on the moon. Prompt notification of such use shall be made to the Secretary-General of the United Nations or State Party concerned.

ARTICLE XIII

A State Party which learns of the crash landing, forced landing or other unintended landing on the moon of a space object, or its component parts, that were not launched by it, shall promptly inform the launching State Party and the Secretary-General of the United Nations.

ARTICLE XIV

1. States Parties to this Agreement shall bear international responsibility for national activities on the moon whether such activities are carried on by governmental agencies or by non-governmental entities, and for assuring that national activities are carried out in conformity with the provisions set forth in the present Agreement. States Parties shall ensure that non-governmental entites under their jurisdiction shall engage in activities on the moon only under the authority and continuing supervision of the appropriate State Party.

2. States Parties recognize that detailed arrangements concerning liability for damage sustained on the moon, in addition to the provisions of the Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and other Celestial Bodies and the Convention on International Liability for Damage Caused by Space Objects, may become necessary as a result of more extensive activities on the moon. Any such arrangements shall be elaborated in accordance with the procedure provided for in article XVIII of this Agreement.

ARTICLE XV

1. Each State Party may assure itself that the activities of other States Parties in the exploration and use of the moon are compatible with the provisions of this Agreement. To this end, all space vehicles, equipment, facilities, stations and installations on the moon shall be open to other States Parties. Such States Parties shall give reasonable advance notice of a projected visit, in order that appropriate consultations may be held and that maximum precautions may be taken to assure safety and to avoid interference with normal operations in the facility to be visited. In pursuance of this article, any State Party may use its own means, or may act with the full or partial assistance of any other State Party, or through appropriate international procedures within the framework of the United Nations and in accordance with the Charter.

2. A State Party which has reason to believe that another State Party is not fulfilling the obligations incumbent upon it pursuant to this Agreement or that another State Party in interfering with the rights which the former State has under this Agreement may request consultations with that Party. A State Party receiving such a request shall enter into such consultations without delay. Any other State Party which requests to do so shall be entitled to take part in the consultations. Each State Party participating in such consultations shall seek a mutually acceptable resolution of any controversy and shall bear in mind the rights and interests of all States Parties. The Secretary-General of the United Nations shall be informed of the results of the consultations and transmit the information received to all States Parties concerned.

3. If the consultations do not lead to a mutually acceptable settlement which has due regard for the rights and interests of all the States Parties, the parties concerned shall take all measures to settle the dispute by other peaceful means of their choice and appropriate to the circumstances and the nature of the dispute. If difficulties arise in connexion with the opening of consultations or if consultations do not lead to a mutually acceptable settlement, any State Party may seek the assistance of the Secretary-General without seeking the consent of any other State Party concerned, in order to resolve the controversy. A State Party which does not maintain diplomatic relations with another State Party concerned shall participate in such consultations, at its choice, either itself or through another State Party or the Secretary-General, as intermediary.

ARTICLE XVI

With the exception of articles XVII to XXI, references in this Agreement to States shall be deemed to apply to any international intergovernmental organization which conducts space activities if the organization declares its acceptance

of the rights and obligations provided for in this Agreement and if a majority of the States members of the organization are States Parties to this Agreement and to the Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and other Celestial Bodies. States members of any such organization which are States Parties to this Agreement shall take all appropriate steps to ensure that the organization makes a declaration in accordance with the foregoing.

ARTICLE XVII

Any State Party to this Agreement may propose amendments to the Agreement. Amendments shall enter into force for each State Party to the Agreement accepting the amendments upon their acceptance by a majority of the States Parties to the Agreement and thereafter for each remaining State Party to the Agreement on the date of acceptance by it.

ARTICLE XVIII

Ten years after the entry into force of this Agreement, the question of the review of the Agreement shall be included in the provisional agenda of the United Nations General Assembly in order to consider, in the light of past application of the Agreement, whether it requires revision. However, at any time after the Agreement has been in force for five years, the Secretary-General of the United Nations, as depository, shall, at the request of one third of the States Parties to the Agreement and with the concurrence of the majority of the States Parties, convene a conference of the States Parties to review this Agreement. A review conference shall also consider the question of the implementation of the provisions of article XI, paragraph 5, on the basis of the principle referred to in paragraph 1 of that article and taking into account in particular any relevant technological developments.

ARTICLE XIX

1. This Agreement shall be open for a signature by all States at United Nations Headquarters in New York. Any State which does not sign this Agreement before its entry into force in accordance with paragraph 3 of this article may accede to it at any time.

2. This Agreement shall be subject to ratification by signatory States. Instruments of ratification and instruments of accession shall be deposited with the Secretary-General of the United Nations.

3. This Agreement shall enter into force among the States which have deposited instruments of ratification on the deposit of the fifth such instrument with the Secretary-General.

4. For States whose instruments of ratification or accession are deposited subsequent to the entry into force of this Agreement, it shall enter into force on the date of the deposit of their instruments of ratification or accession.

5. The Secretary-General shall promptly inform all signatory and acceding States of the date of each signature, the date of deposit of each instrument of ratification of an accession to this Agreement, the date of its entry into force and other notices.

ARTICLE XX

Any State Party to this Agreement may give notice of its withdrawal from the Agreement one year after its entry into force by written notification to the Secretary-General of the United Nations. Such withdrawal shall take effect one year from the date of receipt of this notification.

ARTICLE XXI

The original of this Agreement, of which the Arabic, Chinese, English, French, Russian and Spanish texts are equally authentic, shall be deposited with the Secretary-General of the United Nations, who shall send certified copies thereof to all signatory and acceding States.

IN WITNESS WHEREOF the undersigned, being duly authorized thereto by their respective Governments, have signed this Agreement, opened for signature at New York on . . .

APPENDIX 8—WORKING PAPER PRESENTED TO COPUOS, 1979*

WORKING PAPER REFLECTING THE OUTCOME OF THE REVIEW AT THE PRESENT SESSION OF WORKING PAPER WG.I (1978)/WP.2 OF 3 APRIL 1978 [1]

[Agreement Governing the Activities of States on the Moon and other Celestial Bodies] [Draft Treaty relating to the Moon]

The States Parties to this Agreement

Noting the achievements of States in the exploration and use of the moon and other celestial bodies.

Recognizing that the moon, as a natural satellite of the earth, has an important role to play in the exploration of outer space.

Determined to promote on the basis of equality the further development of co-operation among States in the exploration and use of the moon [and other celestial bodies].

Desiring to prevent the moon from becoming an area of international conflict

Bearing in mind the benefits which may be derived from the exploitation of the natural resources of the moon [and other celestial bodies].

Recalling the Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and other Celestial Bodies, the Agreement on the Rescue of Astronauts, the Return of Astronauts and the Return of Objects Launched into Outer Space, the Convention on International Liability for Damage Caused by Space Objects, and the Convention on Registration of Objects Lanuched into Outer Space.

Taking into account the need to define and develop the provisions of these international instruments in relation to the moon and other celestial bodies, having regard to further progress in the exploration and use of outer space

Have agreed on the following:

ARTICLE I

1. [The provisions of this [Agreement] [Treaty] relating to the moon shall also apply to other celestial bodies within the solar system, other than the earth, except in so far as specific legal norms [or international agreements] enter into force [at the international level] with respect to any of these celestial bodies].

2. For the purposes of this [Agreement] [Treaty] reference to the moon shall include orbits around or other trajectories to or around it.

3. This [Agreement] [Treaty] does not apply to extra-terrestrial materials which reach the surface of the earth by natural means.

ARTICLE II

All activities on the moon including its exploration and use, shall be carried out in accordance with international law, in particular, the Charter of the United Nations, and taking into account the Declaration on Principles of International Law concerning Friendly Relations and Co-operation among States in accordance with the Charter of the United Nations, adopted by the General Assembly on 24 October 1970, in the interest of maintaining international peace and security and promoting international co-operation and mutual understanding, and with due regard to the corresponding interests of all States Parties.

ARTICLE III

1. The moon shall be used by all States Parties exclusively for peaceful purposes.

2. Any threat or use of force or any other hostile act or threat of hostile act on the moon is prohibited. It is likewise prohibited to use the moon in order to commit any such act or to engage in any such threat in relation to the earth, the moon, spacecraft, the personnel of spacecraft or man-made space objects.

3. States Parties shall not place in orbit around or other trajectory to or around the moon objects carrying nuclear weapons or any other kinds of weapons of mass destruction or place or use such weapons on or in the moon.

4. The establishment of military bases, installations and fortifications, the testing of any type of weapons and the conduct of military maneuvers on the moon shall be forbidden. The use of military personnel for scientific research or

*Source: United Nations document A/AC. 105/240, Annex III, p. 4–14.

[1] Working paper WG.I (1978)/WP.2 is reproduced in A/AC.105/218, annex I, appendix.

for any other peaceful purposes shall not be prohibited. The use of any equipment or facility necessary for peaceful exploration and use of the moon shall also not be prohibited.

ARTICLE IV

1. The exploration and use of the moon shall be the province of all mankind and shall be carried out for the benefit and in the interests of all countries, irrespective of their degree of economic or scientific development. Due regard shall be paid to the interests of present and future generations as well as to the need to promote higher standards of living conditions of economic and social progress and development in accordance with the Charter of the United Nations.

2. States Parties shall be guided by the principle of co-operation and mutual assistance in all their activities concerning the exploration and use of the moon. International co-operation in pursuance of this [Agreement] [Treaty] should be as wide as possible and may take place on a multilateral basis, on a bilateral basis, or through international intergovernmental organizations.

ARTICLE V

1. States Parties shall inform the Secretary-General of the United Nations as well as the public and the international scientific community, to the greatest extent feasible and practicable, of their activities concerned with the exploration and use of the moon. Information on the time, purposes, locations, orbital parameters and duration shall be given in respect of each mission to the moon as soon as possible after launching, while information on the results of each mission, including scientific results, shall be furnished upon completion of the mission. In case of a mission lasting more than 60 days, information on conduct of the mission including any scientific results shall be given periodically at 30 days' intervals. For missions lasting more than six months, only significant additions to such information need be reported thereafter.

2. If a State Party becomes aware that another State Party plans to operate simultaneously in the same area of or in the same orbit around or trajectory to or around the moon, it shall promptly inform the other State of the timing of and plans for its own operations.

3. In carrying out activities under this [Agreement] [Treaty] States Parties shall promptly inform the Secretary-General, as well as the public and the international scientific community, of any phenomena they discover in outer space, including the moon, which could endanger human life or health, as well as of any indication or organic life.

ARTICLE VI

1. There shall be freedom of scientific investigation on the moon by all States Parties without discrimination of any kind, on the basis of equality and in accordance with international law.

2. In carrying out scientific investigations in furtherance of the provisions of this [Agreement] [Treaty] the States Parties shall have the right to collect on and remove from the moon samples of its mineral and other substances. Such samples shall remain at the disposal of those Parties which caused them to be collected and may be used by them for scientific purposes. States Parties shall have regard to the desirability of making a portion of such samples available to other interested States Parties and the international scientific community for scientific investigation. States Parties may in the course of scientific investigations also use mineral and other substances of the moon in quantities appropriate for the support of their missions.

3. States Parties agree on the desirability of exchanging scientific and other personnel on expeditions to or installations on the moon to the greatest extent feasible and practicable.

ARTICLE VII

1. In 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 such environment, its harmful contamination through the introduction of extra-environmental matter [, especially nuclear materials,] or otherwise. States Parties shall also take measures to prevent harmfully affecting the environment of the earth through the introducition of extra-terrestrial matter or otherwise.

2. [States Parties shall inform the Secretary-General of the United Nations of the measures being adopted by them in accordance with paragraph 1 of this article and shall also [to the maximum extent feasible] notify him in advance of

all placements by them of radio-active materials on the moon and of the purposes of such placements].

3. States Parties shall report to other States Parties and to the Secretary-General concerning areas of the moon having special scientific interest in order that, without prejudice to the rights of other States Parties, consideration may be given to the designation of such areas as international scientific preserves for which special protective arrangements are to be agreed in consultation with the competent organs of the United Nations.

ARTICLE VIII

1. States Parties may pursue their activities in the exploration and use of the moon anywhere on or below its surface, subject to the provisions of this [agreement] [Treaty].

2. For these purposes States Parties may, in particular:

(a) Land their space objects on the moon and launch them from the moon;

(b) Place their personnel, space vehicles, equipment, facilities, stations and installations anywhere on or below the surface of the moon.

Personnel, space vehicles, equipment, facilities, stations and installations may move or be moved freely over or below the surface of the moon.

3. Activities of States Parties in accordance with paragraphs 1 and 2 of this article shall not interfere with the activities of other States Parties on the moon. Where such interference may occur, the States Parties concerned shall undertake consultations in accordance with article XV, paragraphs 2 and 3.

ARTICLE IX

1. States Parties may establish manned and unmanned stations on the moon. A State Party establishing a station shall use only that area which is required for the needs of the station and shall immediately inform the Secretary-General of the United Nations of the location and purposes of that station. Subsequently, at annual intervals that State shall likewise inform the Secretary-General whether the station continues in use and whether its purposes have changed.

2. Stations shall be installed in such a manner that they do not impede the free access to all areas of the moon of personnel, vehicles and equipment of other States Parties conducting activities on the moon in accordance with the provisions of this [Agreement] [Treaty] or of Article I of the Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and other Celestial Bodies.

ARTICLE X

1. States Parties shall adopt all practicable measures to safeguard the life and health of persons on the moon. For this purpose they shall regard any person on the moon as an astronaut within the meaning of article V of the Treaty on Principles Governing the Activities of States on the Exploration and Use of Outer Space, including the Moon and other Celestial Bodies and as part of the personnel of a spacecraft within the meaning of the Agreement on the Rescue of Astronauts, the Return of Astronauts and the Return of Objects Launched into Outer Space.

2. States Parties shall offer shelter in their stations, installations, vehicles and other facilities to persons in distress on the moon.

ARTICLE XI

[1. The moon and its natural resources are the common heritage of mankind, which finds its expression in the provisions of this [Agreement] [Treaty] and in particular in paragraph 5 of this article.

2. The moon is not subject to national appropriation by any claim of sovereignty, by means of use or occupation, or by any other means.

3. Neither the surface nor the subsurface of the moon, nor any part thereof or natural resources in place, shall become property of any State, international intergovernmental or non-governmental organization, national organization or non-governmental entity or of any natural person. The placement of personnel, space vehicles, equipment facilities, stations and installations on or below the surface of the moon, including structures connected with the surface or subsurface, shall not create a right of ownership over the surface or the subsurface of the moon or any areas thereof. The foregoing provisions are without prejudice to the international régime referred to in paragraph 5 of this article.

4. States Parties have the right to exploration and use of the moon without discrimination of any kind on a basis of equality, and in accordance with international law and the terms of this [Agreement] [Treaty].

5. States Parties to this [Agreement] [Treaty] hereby undertake to establish an international régime, including appropriate procedures, to govern the exploitation of the natural resources of the moon [as such exploitation is about to become feasible]. This provision shall be implemented in accordance with article XVIII of this [Agreement] [Treaty].

6. In order to facilitate the establishment of the international régime referred to in paragraph 5 of this article, States Parties shall inform the Secretary-General of the United Nations as well as the public and the international scientific community to the greatest extent feasible and practicable of any natural resources they may discover on the moon.

7. The main purposes of the international régime to be established shall include:

(a) The orderly and safe development of the natural resources of the moon;

(b) The rational management of those resources;

(c) The expansion of opportunities in the use of those resources; and

(d) An equitable sharing by all States Parties in the benefits derived from those resources,

whereby the interests and needs of the developing countries as well as the efforts of those countries which have contributed either directly or indirectly to the exploration of the moon shall be given special consideration.

8. All the activities with respect to the natural resources of the moon shall be carried out in a manner compatible with the purposes specified in paragraph 7 of this article and the provisions of article VI, paragraph 2, of this [Agreement] [Treaty].

ARTICLE XII

1. States Parties shall retain jurisdiction and control over their personnel, vehicles, equipment, facilities, stations and installations on the moon. The ownership of space vehicles, equipment, facilities, stations and installations shall not be affected by their presence on the moon.

2. Vehicles, installations and equipment or their component parts found in places other than their intended location shall be dealt with in accordance with article V of the Agreement on Assistance to Astronauts, the Return of Astronauts and the Return of Objects Launched into Outer Space.

3. In the event of an emergency involving a threat to human life, States Parties may use the equipment, vehicles, installations, facilities or supplies of other States Parties on the moon. Prompt notification of such use shall be made to the Secretary-General of the United Nations or State Party concerned.

ARTICLE XIII

A State Party which learns of the crash landing, forced landing or other unintended landing on the moon of a space object, or its component parts, that were not launched by it, shall promptly inform the launching State Party and the Secretary-General of the United Nations.

ARTICLE XIV

1. States Parties to this [Agreement] [Treaty] shall bear international responsibility for national activities on the moon whether such activities are carried on by governmental agencies or by non-governmental entities, and for assuring that national activities are carried out in conformity with the provisions set forth in the present [Agreement] [Treaty]. States Parties shall ensure that non-governmental entities under their jurisdiction shall engage in activities on the moon only under the authority and continuing supervision of the appropriate State Party.

2. States Parties recognize that detailed arrangements concerning liability for damage sustained on the moon, in addition to the provisions of the Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and other Celestial Bodies and the Convention on International Liability for Damage Caused by Space Objects, may become necessary as a result of more extensive activities on the moon. Any such arrangements shall be elaborated in accordance with the procedure provided for in article XVIII of this [Agreement] [Treaty].

ARTICLE XV

1. Each State Party may assure itself that the activities of other States Parties in the exploration and use of the moon are compatible with the provisions of this [Agreement] [Treaty]. To this end, all space vehicles, equipment, facilities, stations and installations on the moon shall be open to other States Parties. Such States Parties shall give reasonable advance notice of a projected visit, in order that appropriate consultations may be held and that maximum precautions may be taken to assure safety and to avoid interference with normal operations in the facility to be visited. In pursuance of this article, any State Party may act on its own behalf or with the full or partial assistance of any other State Party or through appropriate international procedures within the framework of the United Nations and in accordance with the Charter.

2. A State Party which has reason to believe that another State Party is not fulfilling the obligations incumbent upon it pursuant to this [Agreement] [Treaty] or that another State Party is interfering with the rights which the former State has under this [Agreement] [Treaty] may request consultations with that Party. A State Party receiving such a request shall enter into such consultations without delay. Any other State Party which requests to do so shall be entitled to take part in the consultations. Each State Party participating in such consultations shall seek a mutually acceptable resolution of any controversy and shall bear in mind the rights and interests of all States Parties. The Secretary-General of the United Nations shall be informed of the results of the results of the consultations and transmit the information received to all States Parties concerned.

3. If the consultations do not lead to a mutually acceptable settlement which has due regard for the rights and interests of all the States Parties, the parties concerned shall take all measures to settle the dispute by other peaceful means of their choice and appropriate to the circumstances and the nature of the dispute. If difficulties arise in connexion with the opening of consultations or if consultations do not lead to a mutually acceptable settlement, any State Party may seek the assistance of the Secretary-General without seeking the consent of any other State Party concerned, in order to resolve the controversy. A State Party which does not maintain diplomatic relations with another State Party concerned shall participate in such consultations, at its choice, either itself or through another State Party or the Secretary-General, as intermediary.

ARTICLE XVI

With the exception of articles XVII to XXI, references in this [Agreement] [Treaty] to States shall be deemed to apply to any international intergovernmental organization which conducts space activities if the organization declares its acceptance of the rights and obligations provided for in this [Agreement] [Treaty] and if a majority of the States members of the organization are States Parties to this [Agreement] [Treaty] and to the Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and other Celestial Bodies. States members of any such organization which are States Parties to this [Agreement] [Treaty] shall take all appropriate steps to ensure that the organization makes a declaration in accordance with the foregoing.

ARTICLE XVII

Any State Party to this [Agreement] [Treaty] may propose amendments to the [Agreement] [Treaty]. Amendments shall enter into force for each State Party to the [Agreement] [Treaty] accepting the amendments upon their acceptance by a majority of the States Parties to the [Agreement] [Treaty] and thereafter for each remaining State Party to the [Agreement] [Treaty] on the date of acceptance by it.

ARTICLE XVIII

[Ten years after the entry into force of this [Agreement] [Treaty], the question of the review of the [Agreement] [Treaty] shall be included in the provisional agenda of the United Nations General Assembly in order to consider, in the light of past application of the [Agreement] [Treaty], whether it requires revision. However, at any time after the [Agreement] [Treaty] has been in force for five years, the Secretary-General of the United Nations, as depository, shall, at the request of one third of the States Parties to the [Agreement] [Treaty] and with the concurrence of the majority of the States Parties, convene a conference of the States Parties to review this [Agreement] [Treaty]. A review con-

ference shall also consider the question of the implementation of the provisions of article XI, paragraph 5, on the basis of the principle referred to in paragraph 1 of that article and taking into account in particular any relevant technological developments.]

ARTICLE XIX

Alternative A

[1. This [Agreement] [Treaty] shall be open to all States for signature. Any State which does not sign this [Agreement] [Treaty] before its entry into force in accordance with paragraph 3 of this article may accede to it at any time.

2. This [Agreement] [Treaty] shall be subject to ratification by signatory States. Instruments of ratification and instruments of accession shall be deposited with the Governments of . . ., which are hereby designated the Depositary Governments.

3. This [Agreement] [Treaty] shall enter into force upon the deposit of instruments of ratification by five Governments including the Governments designated as Depositary Governments under this [Agreement] [Treaty].

4. For States whose instruments of ratification or accession are deposited subsequent to the entry into force of this [Agreement] [Treaty], it shall enter into force on the date of the deposit of their instruments of ratification or accession.

5. The Depositary Governments shall promptly inform all signatory and acceding States of the date of each signature, the date of deposit of each instrument of ratification of and accesssion to this [Agreement] [Treaty], the date of its entry into force and other notices.

6. This [Agreement] [Treaty] shall be registered by the Depositary Governments pursuant to Article 102 of the Charter of the United Nations.]

Alternative B

[1. This [Agreement] [Treaty] shall be open for signature by all States at United Nations Headquarters in New York.

2. This [Agreement] [Treaty] shall be subject to ratification by signatory States. Any State which does not sign this [Agreement] [Treaty] before its entry into force in accordance with paragraph 3 of this article may accede to it at any time. Instruments of ratification or accession shall be deposited with the Secretary-General of the United Nations.

3. This [Agreement] [Treaty] shall enter into force on the 30th day following the date of deposit of the fifth instrument of ratification.

4. For each State depositing its instrument of ratification or accession after the entry into force of this [Agreement] [Treaty], it shall enter into force on the 30th day following the date of deposit of such instrument.

5. The Secretary-General shall promptly inform all signatory and acceding States of the date of each signature, the date of deposit of each instrument of ratification or accession to this [Agreement] [Treaty], the date of its entry into force and other notices.

ARTICLE XX

Any State Party to this [Agreement] [Treaty] may give notice of its withdrawal from the [Agreement] [Treaty] one year after its entry into force by written notification to [the Secretary-General of the United Nations]. Such withdrawal shall take effect one year from the date of receipt of this notification.

ARTICLE XXI

The original of this [Agreement] [Treaty], of which the Arabic, Chinese, English, French, Russian and Spanish texts are equally authentic, shall be deposited with [the Secretary-General of the United Nations], who shall send certified copies thereof to all signatory and acceding States.

IN WITNESS WHEREOF the undersigned, being duly authorized thereto by their respective Governments, have signed this [Agreement] [Treaty], opened for signature at New York on . . .

APPENDIX B—WORKING PAPERS SUBMITTED TO THE WORKING GROUP AT THE PRESENT SESSION

NETHERLANDS: WORKING PAPER

(WG.I (1979)/WP.1)

ARTICLE XIX

1. This Agreement shall be open for signature by all States at United Nations Headquarters in New York.

2. This Agreement shall be subject to ratification, approval or acceptance by signatory States. Any State which does not sign this Agreement before its entry into force in accordance with paragraph 3 of this article may accede to it at any time. Instruments of ratification, approval, acceptance or accession shall be deposited with the Secretary-General of the United Nations.

3. This Agreement shall enter into force on the 30th day following the date of deposit of the fifth instrument of ratification, approval or acceptance.

4. For each State depositing its instrument of ratification, approval, acceptance or accession after the entry into force of this Agreement, it shall enter into force on the 30th day following the date of deposit of such instrument.

5. The Secretary-General shall promptly inform all signatory and acceding States of the date of each signature, the date of deposit of each instrument of ratification, approval, acceptance of, or accession to this Agreement, the date of its entry into force and other notices.

BELGIUM: WORKING PAPER

(WG.I (1979)/WP.2)

ARTICLE XVIII

Divide in paragraphs to read:

1. Ten years . . . requires revision.
2. However . . . developments.

Add a paragraph:

3. Under the same conditions as set out in the preceding paragraphs, the Secretary-General of the United Nations, as depositary, shall convene a conference of the States Parties to negotiate the establishment of the international régime foreseen by the provisions of article XI, paragraph 5.

APPENDIX 9—REPORT OF THE OUTER SPACE COMMITTEE IN 1979: EXCERPTS ON THE MOON TREATY, INCLUDING PARAGRAPHS 62, 63, AND 65 *

7. DRAFT TREATY RELATING TO THE MOON

55. The Committee took note of the work done by the Legal Sub-Committee in accordance with General Assembly resolution 33/16 in its effort to complete the examination of the text of the draft treaty relating to the moon. The Committee also noted that Working Group I of the Sub-Committee had based its discussions on the text of a tentative draft agreement elaborated through informal consultations by the delegation of Austria and that at its eighteenth session an article-by-article reading of this text had taken place.

56. The Committee further noted the recommendation of the Legal Sub-Committee that its parent body, while considering the question of the draft treaty relating to the moon at its current session, should also consider whether the elaboration of a draft treaty could be concluded, or whether progress could be achieved during that session.

57. The Committee established an informal working group of the whole under the chairmanship of Mr. Gyula K. Szelei (Hungary) to consider the matter. The Working Group held four meetings between 26 June and 3 July 1979.

58. The Committee, through the Working Group, considered the compromise text proposed by Austria, which was annexed to the last report of the Committee,[2] with a view to finding a consensus on that text. The Working Group also had before it the text reflecting the outcome of the review at the eighteenth session of the Legal Sub-Committee (A/AC.105/240, annex II, appendix A).

*Source: United Nations, Committee on the Peaceful Uses of Outer Space, Report, New York, United Nations, 1979, pages 10–11. (United Nations, General Assembly, Official Records, 34th Session, Supplement No. 20 (A/34/20)).

[2] Official Records of the General Assembly, Thirty-third Session, Supplement No. 20 (A/33/20), annex II.

59. During the course of the discussions, several proposals were made to amend the Austrian text.

60. After informal consultations among members on the main outstanding issue, a suggestion was made that article XI, paragraph 1, in the Austrian text should be amended to read:

"The moon and its natural resources are the common heritage of mankind, which finds its expression in the provisions of this agreement and, in particular, in paragraph 5 of this article."

This proposal was adopted and article XI, paragraph 1, was amended accordingly.

61. Several further suggestions were made and amendments were agreed upon to article XI, paragraph 7; article XV, paragraph 1; and article XIX. It was also agreed that the title should remain as proposed in the Austrian text.

62. Several suggestions were made to amend article I, paragraph 1. However, after extensive discussion of the matter, it was agreed not to amend the Austrian text but to include in the report of the Committee a statement reflecting the Committee's understanding of the interpretation that should be given to article I, paragraph 1. That understanding is as follows:

"The Committee agreed that by virtue of article I, paragraph 1, the principle contained in article XI, paragraph 1, would also apply to celestial bodies in the solar system other than the earth and to its natural resources."

63. Following a suggestion for clarification of article I, paragraph 2, the Committee agreed that the trajectories and orbits mentioned in article I, paragraph 2, do not include trajectories and orbits of space objects in earth orbits only and trajectories of space objects between the earth and such orbits.

64. With respect to article VII of the Austrian text which refers to the avoidance of harmful contamination of the moon and its environment, it was suggested to introduce a reference to "especially nuclear material". After an extensive discussion, it was agreed that the Austrian text should remain as drafted.

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

APPENDIX 10—U.S. STATEMENT IN SPECIAL POLITICAL COMMITTEE, U.N. GENERAL ASSEMBLY, EXCERPTS ON MOON TREATY, NOVEMBER 1, 1979*

STATEMENT BY AMBASSADOR RICHARD W. PETREE[1]

Mr. Chairman, I appreciate the opportunity to address this Committee regarding international cooperation in outer space activities and some of the matters under consideration by the United Nations Committee on the Peaceful Uses of Outer Space.

1979 was a year of significant accomplishments in the exploration of outer space, and productive work by the United Nations Committee on the Peaceful Uses of Outer Space. The United States has regularly reported major developments in our national and international space programs to the Outer Space Committee and its subcommittees, and I would like to draw the attention of the General Assembly to some of the highlights of our ongoing and planned space programs.

We are pleased to see the increasing number of countries participating in the peaceful uses of outer space. For its part, and in pursuit of its statutory mandate to conduct space activities for the benefit of all mankind, the United States continues to enter into international cooperative space projects. I would like to mention some of the more important United States space activities over the past year.

* * * * * * *

*Source: U.S. Mission to the United Nations, Press Release USUN-107 (79), Nov. 1, 1979, p. 1, 4–7.

[1] U.S. Deputy Representative to the United Nations Security Council, in the U.N. General Assembly Special Political Committee on the Report of the U.N. Outer Space Committee and the Agreement Governing the Activities of States on the Moon and Other Celestial Bodies, Nov. 1, 1979.

MOON TREATY

After some seven years of effort, the Outer Space Committee has completed a draft of the Agreement Governing the Activities of States on the Moon and Other Celestial Bodies (the "Moon Treaty"). The successful completion by the Committee on the Peaceful Uses of Outer Space of the Moon Treaty is a reaffirmation of the constructive spirit of the Outer Space Committee, which has now produced some five treaty texts since its inception—an enviable record. It is also a reaffirmation of the valdity of the consensus procedures by which the Outer Space Committee operates. Consensus may not be the speediest method of work, but it is the method which best ensures that the results of the Outer Space Committee are meaningful.

It is a method especially appropriate to dealing with outer space, which the Outer Space Treaty declares to be the common province of mankind, and with Article XI of the draft Moon Treaty, which declares that celestial bodies (other than the earth) and the natural resources of such celestial bodies are the common heritage of mankind.

The draft Moon Treaty is based to a considerable extent on the 1967 Outer Space Treaty. Indeed, the discussion in the Outer Space Committee confirmed the understanding that the Moon Treaty in no way derogates from or limits the provisions of the 1967 Outer Space Treaty.

Of course, the draft Moon Treaty also is, in its own right, a meaningful advance in the codification of international law dealing with outer space, containing obligations which are of both immediate and long-term application in regard to such matters as the safeguarding of human life on celestial bodies, the promotion of scientific investigation and the exchange of information relative to and derived from activities on celestial bodies, and the enhancement of opportunities and conditions for evaluation, research and exploitation of the natural resources of celestial bodies. We think it useful to address some of the especially significant provisions contained in the draft Moon Agreement, this "fifth star" in the constellation of outer space treaties.

There has been considerable discussion of Article I of the draft treaty. We accept the Outer Space Committee's conclusions as to this article—namely, first, that references to the moon are intended also to be references to other celestial bodies within our solar system other than the earth; secondly, that references to the moon's natural resources are intended to comprehend those natural resources to be found on these celestial bodies; and, thirdly, that the trajectories and orbits referred to in Article I, paragraph 2, do not include trajectories and orbits of space objects between the earth and earth orbit or in earth orbit only. In regard to the phrase "earth orbit only", the fact that a space object in earth orbit also is in orbit around the sun does not bring space objects which are only in earth orbit within the scope of this treaty.

In regard to Articles II and III of the draft treaty, we cannot fail to note the concerns expressed by members of the Outer Space Committee lest outer space become yet another area where man makes war. Article II reaffirms the application of the Charter of the United Nations and of international law to outer space. While the Charter predates man's entry into space, its principles and provisions, including those relating to the permissible and impermissible uses of force, are as valid for outer space as they are for our seas, land or air. We welcome the international community's reaffirmation in the Moon Treaty of this essential point.

Article III contains a statement of the principle that the celestial bodies and those orbits around them and to them are only to be utilized for peaceful—i.e., non-aggressive—purposes. Paragraph 2 of Article III spells out in some detail some of the consequences to be drawn from Article II. Specifically, paragraph two's purpose is to make clear that it is forbidden for a party to the Moon Treaty to engage in any threat or use of force on the moon or in other circumstances set forth in paragraph 2 if such acts would constitute a violation of the party's international obligations in regard to the threat or use of force.

Article VII contains important protections for the environment of celestial bodies. We endorse the Committee's understanding that the language of this article is not intended to be read in such a way as would result in prohibiting the exploitation of natural resources to be found on celestial bodies but, rather, that any such exploitation is to be carried out in such a manner as to minimize, insofar as is possible, disruption of or adverse changes in the environment.

The common heritage concept, which was initially suggested by Argentina, but formally proposed by the United States in 1972, is set forth in Article XI, paragraph 1, which makes clear that its meaning, for purposes of the Moon Treaty, is to be found within the Moon Treaty itself. Likewise, its meaning in the

Moon Treaty is without prejudice to its use or meaning in any other treaty. Article XI also makes clear that the parties to the treaty undertake, as the exploitation of the natural resources of the celestial bodies other than the earth is about to become feasible, to enter into negotiations to establish a mutually acceptable international regime to govern the exploitation of those mineral and other substantive resources which may be found on the surface or subsurface of a celestial body. My Government will, when and if negotiations for such a regime are called for under Articles XI and XVIII, make a good faith effort to see that such negotiations are successfully concluded. Each of the participants in a regime conference will, of course, have to evaluate any treaty that emerges from the conference in the light of its own national interests. For the United States, this would require a conclusion that the treaty is balanced and reasonable and would then, as a constitutional matter, require submission to the Senate for its advice and consent, just as we have sought and obtained advice and consent to United States ratification of the four outer space treaties now in force.

The draft treaty, as part of the compromise by many delegations, places no moratorium upon the exploitation of the natural resources on celestial bodies by States or their nationals, but does provide that any exploitation of the natural resources of celestial bodies be carried out in a manner compatible with the purposes specified in paragraph 7 of Article XI and the provisions of paragraph 2 of Article VI. We view the purposes set forth in paragraph 7 as providing both a framework and an incentive for exploitation of the natural resources of celestial bodies. They constitute a framework because even exploitation which is undertaken by a State Party to the Treaty or its nationals outside of the context of any such regime, either because the exploitation occurs before a regime is negotiated or because a particular State may not participate in the international regime once it is established, will have to be compatible with those purposes set forth in Article XI, paragraph 7, of the Moon Treaty.

This same paragraph also is an incentive. By setting forth now the purposes governing exploitation of natural resources, uncertainty is decreased and both States and private entities may now find it possible to engage in the arduous and expensive efforts necessary if exploitation of the natural resources of the celestial bodies is ever to become a reality. Especially vital in this regard is the fact that Article XI (7)(d) recognizes that an equitable sharing of the benefits derived from the natural resources of celestial bodies necessitates giving special consideration to those who have contributed directly to the exploration of the moon, as well as to the needs of developing countries and those who have indirectly contributed to the moon's exploration. This language also reflects the international cooperation that exists today in telecommunications and other practical applications of space, for example, Intelsat, Intersputnik and Inmarsat, where those States who have expended large resources, either public or private, to develop space systems to exploit these applications have equitably shared the benefits with the international community.

We also note that Article XI, paragraph 8, not only covers and sets the standards for the general right to exploit natural resources (in a manner compatible with Article XI (7)) but also is intended to ensure that the unrestricted right to collect samples of natural resources is not infringed upon and that there is no limit upon the rights of States Parties to utilize in the course of scientific investigations, such quantities of those natural resources found on celestial bodies as are appropriate for the support of their missions.

EVENTS OF INTEREST

A. Past Events

1. AIAA Conference on Large Space Platforms, San Diego, Feb. 2, 1981

The Technical Committee (TC) on Legal Aspects of Aeronautics and Astronautics of the American Institute of Aeronautics and Astronautics (AIAA) sponsored a panel on "Legal, Institutional and International Issues Involved in Multipurpose Space Platforms," in connection with the AIAA 2nd Conference on Large Space Platforms in San Diego, California, on February 2, 1981.

Gerald J. Mossinghoff, NASA's Deputy General Counsel and Chairman of the TC, was the moderator of the panel. The discussions included a presentation by Professor Carl Christol of the University of Southern California on three areas of space law particularly relevant to large space platforms: exploitation of the orbit/spectrum resource, nuclear power sources in outer space, and definition/delimitation of outer space. This was followed by a detailed discussion by Joseph Pelton, Executive Assistant Director General of INTELSAT, of the economic, technical, operational, legal and political aspects of what he referred to as "the space platform girdle."

Dr. George Peter van Reeth, Director of Administration for the European Space Agency, summarized that agency's multinational plans for low earth orbit space programs, thus supplementing the analysis of Pelton. Dr. David Tong, Manager of Satellite Systems at Canadian Astronautics Ltd., then presented the results of a major study that company had undertaken for the Canadian Department of Communications to evaluate the potential impact of the large multifunction platform on Canadian satellite systems. There was a general conclusion that the panel had served to focus attention of scientists and engineers on potential legal and institutional barriers to the introduction of large space platforms, which barriers could prove to be more significant than the technological and engineering challenges such platforms would present.

Gerald J. Mossinghoff,
Deputy General Counsel, NASA
Chairman of the AIAA Technical
Committee on the Legal Aspects
of Astronautics and Aeronautics

2. Inter-American Bar Association Meeting, Quito, March 16-18, 1981.

Meetings of the Section on "Air and Space Law" were held during the XXII Conference of the Inter-American Bar Association (IABA), at Quito, Ecuador, March 16, 17, and 18, 1981, attended by attorneys, judges and law educators from the countries of North and South America.

The meetings of Section B on "Air and Space Law" were held jointly with Section A on "Law of the Sea and Oceanography", both of Committee I on Public

International Law. Captain John R. Brock, U.S.A., in the absence of Judge Harold Berger of Philadelphia, Section B Chairman, acted as chairman and moderator. Those delivering papers in either English or Spanish, and their topics on Air and Space Law included:

1. "The Space Shuttle and Satellite Energy", by Dr. Stephen Gorove, University of Mississippi Law Center, U.S.A.

2. "La Declaracion de Soberania de los Estados Ecuatoriales, en los Segmentos Correspondientes de la Orbita Sincronica Geoestacionaria.", by Dr. Rodrigo Salazar B., Ecuador.

3. "Del Derecho Internacional Publico Aeronautico al Privado-El Contrato de Transporte Aereo-De Varsovia A Guatemala con Escala en La Haya", by Dr. Miguel Angel Cevallos Hidrobo, Ecuador.

4. "La Integracion en el Transporte Aereo", by Dr. Alvaro Bauza Araujo, Ecuador.

The discussions of the foregoing papers concerning their content and related subjects were lively and constructive, contributing to an outstanding and successful program.

After the presentation of papers a resolution on Solar Power Satellites was proposed by Professor Gorove and subsequently approved by the Committee and the IABA Conference.*

Alfred M. Klein, Chairman
Committee I, IABA

3. American Astronautical Society Goddard Memorial Symposium Pentagon City, Virginia, March 26-27, 1981.

The American Astronautical Society held its nineteenth Goddard Memorial Symposium on March 26-27, 1981 at the Quality Inn, Pentagon City, Virginia. The theme of the symposium was International Space Technical Applications. The Sympoisum was co-sponsored by the American Chemical Society, the American Institute of Aeronautics and Astronautics, the American Society for Aerospace Education, the L-5 Society, National Space Club, National Space Institute and the Sunsat Energy Council.

The first day of the Symposium featured four sessions concerned with industry in space, international Landsat programs, communications, weather and climate. The following day a luncheon was held, the guest speaker being Senator Harrison H. Schmitt (New Mexico). The concluding sessions were on space based earth science applications, space based manufacturing and power generation and space science futures. Concurrently the 3rd annual space history symposium dealt with the impact of science

*For a text of the Resolution, see Current Documents, *infra*.

fiction upon technology. Copies of papers may be obtained from the American Astronautical Society, 6060 Duke Street, Alexandria, Virginia 22304.

Eilene Galloway
President, von Kármán
Memorial Foundationa

4. Military Space Doctrine Symposium, United States Air Force Academy, Colorado Springs, April 1-3, 1981.

The United States Air Force Academy hosted a Symposium on Military Space Doctrine at the Academy near Colorado Springs, Colorado, April 1-3, 1981. Guest speakers included Dr. Hans Mark, former Secretary of the Air Force; General Bernard Schriever (USAF Retired); Dr. Charles W. Cook, Deputy Assistant to the Secretary of the Air Force, Space Plans and Policy; Lieutenant General Richard C. Henry, USAF, Commander, Space Division; and Dr. I. B. Holley, Jr., Duke University. Separate panels were convened to examine past, present and future aspects of the following topics: (1) U.S. Space Operations Doctrine, (2) U.S. Space Organization and (3) USSR/International Space Operations Doctrine and Organization.

Over 50 papers were submitted in advance of the Symposium and printed by the Academy in four volumes. Unfortunately, these volumes are already out of print and it appears unlikely that there will be an additional printing. Included in the writings were two papers on the law of outer space; one by Dr. Harry Almond of the National War College, the other by Lieutenant Colonel Robert L. Bridge, Office of The Judge Advocate General, USAF. Other lawyers interested in space law in attendance were Brigadier General Martin Menter (USAF Retired); Mr. George Robinson, Office of General Counsel, The Smithsonian Institute and Mr. Mike Zehner, Office of the Air Force General Counsel. The 275 participants at the Symposium included representatives from several Air Force commands, the Office of the Joint Chiefs of Staff, the Office of the Secretary of Defense and several retired military officers and members of the academic community. The overwhelming consensus of those in attendance was that the Symposium should become an annual event.

The Final Report of the Symposium should be available in the Summer of 1981.

Robert L. Bridge
Lieutenant Colonel, USAF
International Law Division,
Office of The Judge Advocate General

5. Symposium on International Communications and the New Information Order, Syracuse University College of Law, Syracuse, N.Y., April 11, 1981.

The International Law Society at Syracuse University College of Law arranged the program consisting of four speakers during the morning session and three during the afternoon session. A panel followed each session during which panelists made comments

and asked questions of the speakers. Members of the audience were also invited to question the speakers and the panelists. The speakers were Messrs. Gabriel Warren, Director General, International Telecommunications, Department of Communications, Canada; Stephen E. Doyle, Director, Domestic Space and Weapon Systems, Aerojet Services Co., Sacramento, California; Ram Jakhu, Senior Research Assistant, Center for Research of Air and Space Law, McGill University, Montreal, Canada; Lesueur Stewart who is completing research at the United Nations on dissertation "Progressive Development of International Law in light of the New International Information Order" towards S.J.D. degree from Harvard University School of Law; Ambassador Mustapha Masmoudi, Tunisia Permanent Delegate to UNESCO; Charles M. Dalfen, Attorney, Ottawa, Formerly Vice-Chairman Canadian Radio-Television and Communications Commission; and Carl Q. Christol, Professor of International Law and Political Science, University of Southern California.

Panelists were David Berkman, Assistant Dean, Telecommunications and Film Division S.I. Newhouse School of Public Communications, Syracuse University; Edwin Bock, Professor of Political Science, Maxwell School of Citizenship and Public Affairs, Syracuse U.; W. John Hottenstein, Administrator, International Broadcasting Seminar, S.I. Newhouse School of Public Communications, Syracuse U.; Theodore M. Hagelin, Professor of Law, Syracuse U. College of Law; David Rice, Professor of Law, New York Law School Communications Center.

Martin Menter served as Moderator of both sessions and presented opening remarks outlining the legal issues involved and their background in the dual-subject program.

Martin Menter
Vice-President, International
Institute of Space Law

6. "Space Law Workshop", American Society of International Law Meeting, Washington, D.C., April 24, 1981

On April 24, 1981, during the annual meeting of the American Society of International Law, a Space Law Workshop on the "Space Shuttle Era: International and Domestic Implications" was held in Washington, D.C. under the sponsorship of the Association of the U.S. Members of the International Institute of Space Law, the American Society of International Law and the Federal Bar Association. Speakers included L. Michael Weeks, Deputy Associate Administrator for Space Transportation Systems, NASA, who spoke on "Technical Capabilities;" Jerald J. Mossinghoff, Deputy General Counsel, NASA, who addressed "Domestic Legal Aspects;" and Professor Stephen Gorove, University of Mississippi Law Center, who spoke on "International Legal Aspects." Commentators were Professor Myres S. McDougal, of Yale; Irwin M. Pikus, Division of Strategic Planning and Analysis, National Science Foundation; and Professor Oscar O. Schachter, of Columbia University Law School. The meeting was chaired by Professor Gorove and Edward R. Finch, Jr., of the New York, D.C., and Florida Bars, acted as moderator.

The workshop session drew an overflow audience of about 120-150 people and invoked lively discussions from among the panelists as well as from the audience. While

there were no formal papers submitted, it is expected that the presentations and discussions will be published in the 1981 Proceedings of the American Society of International Law.

The highly successful session was followed by a business meeting of the Association, during which Ms. Helen Kupperman, Secretary of the Association gave an unofficial report on the recent UNCOPUOS Legal Subcommittee meeting, indicating that her views did not necessarily represent the views of any organization with which she was connected. Subsequently, she summed up her presentation in the following manner:

> "The Legal Subcommittee (LSC) of the United Nations Committee on the Peaceful Uses of Outer Space (COPUOS) met in Geneva, Switzerland from March 16, 1981 through April 10, 1981. Considerable time was spent by the working group in intensive informal discussions on the agenda item concerning Direct Television Broadcast Satellites (DBS) principles. Although agreement was not reached on a set of principles, progress was made. It is expected that discussions will be continued at the COPUOS.
>
> The Remote Sensing working group continued its work at the LSC and a new working group on the use of Nuclear Power Sources (NPS) in Outer Space was formed. Discussions in the NPS working group focused primarily on an exchange of views. Regarding the agenda item on Definition/Delimitation of Outer Space, two proposals as to how the future work should proceed were made. The USSR proposed that the item be made into two agenda items (1. Definition/Delimitation and 2. the Geostationary Orbit) and that priority and a working group be accorded the Definition/Delimitation issue. Colombia proposed that it remain one agenda item and be accorded priority and a working group. The COPUOS will decide the issue.
>
> The following new working papers were introduced: In DBS, a twelve-nation sponsored paper; in remote sensing, a Colombian paper and a Mexican paper; and in NPS, a Canadian paper, an Italian paper, and a Venezuelan paper."*

Stephen Gorove
Chairman, "Space Law Workshop"
ASIL Annual Meeting, 1981

**Editor's note:* For a Report on the Work of the 1981 UNCOPUOS including its Scientific and Technical and Legal Subcommittees, see Events of Interest, 8, *infra*; for reports of the Working Groups on Remote Sensing and DBS, see Current Documents I and II, *infra*.

7. Conference on "Space Manufacturing—International and Legal Considerations" Princeton University, May 18, 1981

On May 18, 1981, a session on "International and Legal Considerations" regarding space manufacturing was held at Princeton University to lead off the Fifth Princeton Conference on Space Manufacturing. The Conference also dealt with a wide range of technical, scientific and sociological aspects of the subject.

The "International and Legal Considerations" session was chaired by Dr. Irwin M. Pikus of the National Science Foundation. It included presentations by Nandasari Jasentuliyana of the United Nations Outer Space Affairs Division on "Institutional Cooperation relevant to Space Manufacturing"; Eilene Galloway, President of the Theodore von Karman Memorial Foundation on "Space Manufacturing and the Proposed Moon Agreement"; Marta Cehelsky of the National Science Foundation on "Space Manufacturing: Stake, Interest and Potential Role of Developing Nations"; Professor Stephen Gorove of the University of Mississippi Law Center on "Recent Trends in Space Law: Focus on the LDC's"; Bruce Bon of the Jet Propulsion Lab at the California Institute of Technology on "International Space Policy and the Interests of the United States and the Developing Countries"; Martin Rothblatt of the University of California on "International Resource Allocation Policy Governing Development of Asteroidal Wealth"; Amanda L. Moore of Bronxville, N.Y. on "Space Manufacturing Facilities and the Law of Telecommunications: Invisible Resources and International Law"; and Edward R. Finch, Jr., of Finch and Schaefler, New York City, on "International Legal Regimes for Outer Space Resources."

Discussion sessions interposed between groups of papers brought clearly to light several concerns on the part of technicians and business interests. Concern was expressed that the fabric of international public law and, in fact, our recent foreign policy may be unduly penalizing entrepreneurial initiatives particularly in regard to space industrialization. In this regard, the meaning of the term "heritage of mankind," used in the language of the Agreement Governing the Activities of States on the Moon and Other Celestial Bodies as well as in other international negotiations, was questioned and compared with the "province of mankind" language of the 1967 Outer Space Treaty. The distinction between equal sharing and equitable sharing was highlighted and came up a number of times in the course of discussion. The relationship between guarantees of profitability and the need for private ownership of parts of celestial bodies was explored briefly.

In addition to matters relating to existing law, this session highlighted several areas needing further development. In particular, among others, the notion of resource sharing, the relationship between telecommunications and other uses of space, and the arrangements among countries on multilateral institutional bases, as for example in the "international regime" envisioned in the Moon agreement, were noteworthy.

Irwin M. Pikus
Director, Division of Strategic Planning and Analysis
National Science Foundation

8. Report on the Work of United Nations Committee on the Peaceful Uses of Outer Space in 1981 *

The United Nations Committee on the Peaceful Uses of Outer Space (UN-COPUOS) continued consideration of several important issues in 1981 through its Scientific and Technical Sub-Committee which met in New York from 2-13 February and its Legal Sub-Committee which met in Geneva from 16 March to 10 April. Several working groups established by the Committee and its Sub-Committees also met during this period. For a complete discussion of the issues involved, reference should be made to the Report of the Scientific and Technical Sub-Committee (A/AC.105/287) and the Report of the Legal Sub-Committee (A/AC.105/288). What follows is only a summary of discussions relating to the important legal issues.

Under the mandate given to it by the General Assembly, the Committee is currently giving priority consideration to the elaboration of draft principles relating to remote sensing of the earth from space and the use of satellites for direct television broadcasting. It is also considering the legal implications of the use of NPS in outer space, matters relating to definition and/or delimitation of outer space and outer space activity, and the questions relating to the geostationary orbit. The Committee has also recently begun considering the implications of space transportation systems and is engaged in the preparation for the Second United Nations Conference on the Exploration and Peaceful Uses of Outer Space.

Progress in the work of the Committee this year relating to legal issues, however, was minimal. This lack of progress generally seems to emphasize the apparent intransigence of established national positions. The Committee, through the efforts of its Legal Sub-Committee, had previously proceeded much more rapidly in its work; however, many of the issues resolved were of lesser complexity and importance than those which now remain outstanding. The Committee must now confront those issues on which Member States have expoused fundamentally differing positions and therefore progress will be slow and reflective of painstaking compromisary efforts required.

Remote Sensing of Earth from Space

The Committee, through its Legal Sub-Committee, had drafted 12 draft principles relating to remote sensing at its previous sessions. However, several texts had alternative formulations or were within square brackets indicating the areas where agreement was still to be achieved.

This year work was continued in the Legal Sub-Committee based on the texts worked out previously. A number of working papers were submitted and extensive discussions were undertaken, but the work was concluded without achieving any concrete progress.

This was so because those issues which are most easily reconcilable have now been resolved. This leaves only those issues which are more complex and basic to the divergent view of the States. The natural consequence is that progress on this item will proceed only as Member States exercise an active desire and political will to accomplish the necessary compromises.

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*The views expressed herein do not necessarily reflect the views of the United Nations.

The remaining issues concern the concepts of freedom of State activity in outer space and the freedom of dissemination of remote sensing information on the one hand and the concept of State sovereignty over its natural resources and information on the other. The developing countries in particular would like to establish a regime that would restrict the dissemination of certain data and information acquired through remote sensing activities subject to prior consent of the sensed State, while the United States and certain Western European countries feel strongly that there should be no such restriction which, in their view, is impractical as information on remote sensing activities is already openly available to all countries and individuals and an attempt to control such information would therefore be futile. The socialist countries, following a proposal made by the USSR, would like to make spatial resolution as a criterion to differentiate between data to be freely disseminated and those to which the consent regime should be applicable.

A new proposal that was introduced this year was contained in a working paper submitted by Columbia. It attempted to introduce a new distinction between "macroscopic" and "microscopic" remote sensing. Under this definition, the first category would cover information on the characteristics of the earth and its natural phenomena obtained from outer space by sensors onboard satellites, the dissemination of which would not be subject to restrictions, the second category of information collected by airborne platforms operating below the lower level of outer space, could be used and/or disseminated to third parties only with the express consent of the sensed state. This porposal also suggested that information on specific natural resources or agricultural crops be disseminated only with the prior consent of the sensed State. While some countries indicated their agreement with this basic approach in as much as a distinction was drawn between different types of remote sensing activities and conclusions were drawn from this distinction as to the regime for the dissemination of data, other countries felt that the new definitions proposed were likely to create more problems than they would solve, particularly because the new definitions included activities which could not be qualified as "space activities" which were beyond the mandate of the Committee to regulate.

Mexico submitted a proposal containing a complete text of draft principles based on the work so far carried out by the Committee and reflecting the views of developing countries in the debate and thus requiring greater participation of the sensed State. There was only a preliminary exchange of views on this proposal as countries reserved their right to discuss it next year.

In the Scientific and Technical Sub-Committee there were discussions aimed at clarifying remote sensing data based on spatial resolution with a view to making spatial resolution the basis of a regime for dissemination of information. There was, however, no agreement as some countries did not feel that there was a scientific or technical basis for such a classification.

Direct Television Broadcasting

The Committee, through its Legal Sub-Committee had worked out texts of 12 draft principles and a preamble at its previous session. Some texts, however, remained within square brackets indicating that final agreement on them was yet to be achieved.

The discussions continued this year on the basis of the texts worked out previously as well as other proposals, particularly a text prepared by Canada and Sweden in 1980 which, in a sense, was the same as the draft prepared by the Committee without square brackets found in its text. In spite of extensive discussions, the efforts led to little progress.

Although a number of factors contributed to this lack of progress, one problem remains central, and that is that the position of various countries on the main issues remained identical to the position taken by them in the previous year. The basic dilemma regarding Direct Television Broadcasting is similar to that which the Committee presently faces in Remote Sensing. At this stage, those issues which could be agreed upon through minor shifts in positions have already been resolved. This leaves only those principles on which fundamental policy differences exist, and consensus will not be reached unless important and difficult political compromises are carefully elaborated.

The remaining principal point of contention relate to differing position held with regard to the principle of freedom of information and that of sovereignty of States which form the basis of the remaining principles covering State responsibility, consent and participation, programme content and unlawful broadcasts. The centre of the controversy is whether or not direct television broadcasting to a foreign country must have the prior consent of the receiving State. The developing countries and the socialist countries reiterated their view that prior agreement is necessary while the United States, Japan and several western European States continue to expouse a policy of absolute freedom in the dissemination and reception of information. Until a compromise is reached between these two views on the central question, little progress on the elaboration of draft principles will be possible.

Following the discussions in the Legal Sub-Committee which took place primarily during informal sessions, a negotiating text was submitted which was co-sponsored by 12 countries (Argentina, Brazil, Canada, Chile, Columbia, India, Indonesia, Iraq, Kenya, Mexico, Niger and Venezuela) though not an agreed text, reflects the views of a substantial number of States and seems to have the general support of the developing countries and the socialist countries as well as some others. Although this text does not contain specific provisions of prior consent, programme content and unlawful broadcasts, the United States and some other delegations did not feel that it is an appropriate basis for negotiations.

The Use of Nuclear Power Sources in Outer Space

Under a mandate of the General Assembly, the Committee had previously established a working group of the Scientific and Technical Sub-Committee to consider matters relating to the Use of Nuclear Power Sources (NPS) in Outer Space. The working group, after three years of work, completed its work this year and concluded that "NPS can be used safely in outer space, provided that all safety requirements are met". What the safety requirements should be is discussed in the report.

Following this work, the Committee through its Legal Sub-Committee considered the possibility of supplementing the norms of international law relevant to the use of NPS in outer space.

Several countries led by Canada, after reviewing existing international law, felt that there is a lacuna to be filled by supplementing the existing international law to ensure the safe use of NPS in outer space. Other countries including the Soviet Union felt that a comprehensive study of relevant international law had not been done yet and that the consideration of supplementing relevant norms could begin only after that.

The discussions centered on proposals contained in three working papers submitted by Canada, Venezuela and Italy respectively. The Canadian proposal suggested drafting principles in four areas: (1) Information concerning the use of NPS; (2) Notification prior to re-entry; (3) Assistance to States; and (4) Radiation exposure levels. Under these categories it suggested that the launching state should provide the Secretary-General of the United Nations, at least one month prior to the launch of an NPS, with information including specific data on the space object concerned and the Secretary-General be notified of anticipated re-entry and provide him with information to enable Member States to assess the likelihood and consequences of a particular re-entry and carry out preparations for search and rescue of NPS and protection of their population. It also spelt out certain requirements concerning radiation exposure levels and other safety requirements. The proposal submitted by Venezuela was in general similar to that contained in the Canadian working paper, and the Italian working paper contained comments on certain provisions in the Canadian proposal. Unlike the Canadian proposal, Venezuela and Italy suggested inclusion of provisions relating to liability for damages caused by such objects.

Although a detailed discussion took place on the proposals, no agreement could be reached in view of the fundamental difference to view as referred to above concerning the appropriateness of supplementing international law norms in this field.

Definition and/or Delimitation of Outer Space and Outer Space Activities

The Committee continued its consideration of this item which it had discussed previously for several years. The debate generally reflected the views previously expressed. Particular attention was focussed on a proposal made in 1979 by the Soviet Union to delimit air and outer space at an altitude not higher than 100-110 kilometers and leaving the area below that to be the subject of negotiations by States while providing for freedom of transit for space objects in that region. Many States expressed their support for a solution along the lines suggested in the Soviet proposal, however, some others recognized the arbitrariness of selecting criteria for such a boundary and recommended that functional and other criterion also be examined. The United States, Japan and the United Kingdom in particular felt that there was no legal or scientific basis for defining such a boundary and as no practical difficulties had hitherto arisen due to a lack of definition, it was not necessary to resolve the matter.

While the discussion showed that a growing number of countries wishes to have a definition on outer space, no agreement could be reached due to the differences of view stated above.

Questions relating to the Geostationary Orbit

In considering the related question of the geostationary orbit, positions expressed at the previous session were reiterated. Thus, some equatorial States restated their view

that the geostationary orbit as a limited natural resource is subject to sovereignty of subjacent States. In opposition to this concept remained all non-equatorial countries, including the Space Powers, which maintained that the geostationary orbit is an integral part of outer space and, in accordance with the outer space treaty, is not subject to the sovereignty of any country. The view was also expressed that, as the number of satellites that could be placed in the geostationary orbital position should be the subject of agreement within the framework of the International Telecommunication Union (ITU).

Space Transportation Systems

The Committee, through its Scientific and Technical Sub-Committee, considered the questions relating to Space Transportation Systems and their implications for future activities in space. During the discussions, some countries noted the importance of large-scale activities in outer space and the consequences to the environment due to the increased use of Space Transportation Systems. The Committee reviewed the various Space Transportation Systems being developed and decided to continue consideration of this matter next year and called upon the Secretariat to update the study it had prepared on the International Implications of Space Transportation Systems.

UNISPACE-82

The General Assembly has convened the Second United Nations Conference on the Exploration and Peaceful Uses of Outer Space to be held in Vienna from 9-21 August 1982. The Committee has been designated as the Preparatory Committee for this Conference. It worked out the agenda of the Conference, the list of participants to be invited, the rules of procedure, schedule and other organizational aspects of the Conference. It also began the preparation of a draft for the final report of the Conference on the basis of the national papers submitted by Member States. Further work relating to the Preparatory Committee will be continued by the Committee at its next session.

N. Jasentuliyana
Chief of Section, Outer Space
Affairs Division, United Nations

9. Other Events

Several other conferences and symposia were planned and/or held discussing issues of space law, science and policy. Among them the following may be noted:

(a) The Annual Meeting of the Technical Committee on Legal Aspects of Aeronautics and Astronautics, Washington, D.C. February 23, 1981 with featured speaker Paul G. Dembling on "25 Years of Space Law Development";

(b) A panel discussion on "Space Transportation Systems Update" arranged by the 18th Space Congress in Cocoa Beach, Florida, April 29-May 1, 1981, under the auspices of the Canaveral Council of Technical Societies, on such topics as "Shuttle Status and Plans", "Free Market Opportunities in the U.S. Space Program", "Energy Programs", "Planetary Programs" and "DOD Space Program Activities";

(c) A Special Symposium on the commercial implications of the Space Shuttle, Boston, May 14, 1981, organized by Arthur D. Little, Inc.;

(d) During the Annual Meeting of the AIAA in Long Beach, California, May 12-14, 1981, a session on "Space Law in the 1980's" was chaired by John Cavanagh of Lockheed Corp. At the session presentations were made by S. Neil Hosenball of NASA on "Managing Business Risks in Commercial Space Ventures", Prof. Carl Christol of the University of Southern California on "An Inventory of Legal Aspects of Outer Space" and Raymond G. Leeth of Rockwell International on "Practical Aspects of the Impact of Space Law on a Space Shuttle User".

(e) A Seminar planned by the Pacific Telecommunications Council on June 5, 1981 in Washington, D.C. on such topics as "The Role of Telecommunications in Political and Foreign Affairs", "Planning Telecommunications Services to Meet User Needs", and "Computers and Communication, 'C & C' in the Pacific Age".

10. Brief News.

As a result of the General Assembly decision taken in November 1980, the Outer Space Committee's membership was increased from 47 to 53. The new members are China, Spain, the Syrian Arab Republic, Upper Volta, Uruguay, and Viet Nam. Zimbabwe has become the 155th member of the International Telecommunication Union . . . and Ireland the 11th member of the European Space Agency (ESA). Ireland's contribution to the Agency's budget is 0.54% of the total . . . The Agreement of Association between Austria and ESA, signed on October 17, 1979 came into force on April 1, 1981 . . . Under the terms of the Agreement between Norway and ESA, signed on April 2, 1981, but subject to approval by the Norwegian Parliament. Norway will have Associate Member status with ESA for a period of five years during which time it may consider acceding to the Convention of May 30, 1975 and thus becoming a full Member.

B. Forthcoming Events

As reported previously, the 24th Space Law Colloquium will be held during the XXXIInd Congress of the International Astronautical Federation in Rome, Italy, on September 6-12, 1981. Subjects to be discussed include: 1) Legal Implications of Economic Activities in Space; 2) Legal Status of Artificial Space Objects; 3) Legal Implications of Space Transportation Systems; and 4) Institutional Arrangements for Space Activities.

A Symposium on "Earth-Oriented Space Activities and their Legal Implications" will be held at the Centre for Research of Air and Space Law, McGill University on October 15-16, 1981.

An "International Conference on Doing Business in Space: Legal Issues and Practical Problems" will be held on November 12-14, 1981 at the L'Enfant Plaza Hotel in Washington, D.C. Further information may be obtained from ALI-ABA, 4025 Chestnut St., Philadelphia, PA 19104.

A Conference on "Telecommunications in the Year 2000 - National and International Perspectives", sponsored by the Program in International Telecommunication Training and Research, the International Center and the Office of Conference Development, Rutgers University, New Brunswick, New Jersey, is expected to be held, November 17-20, 1981.

The 1982 Pacific Telecommunications Conference is planned to take place in Hawaii during January 18-20, 1982 in Honolulu, Hawaii.

The Section on Aviation and Space Law of the Association of American Law Schools will have a session devoted to "Private Enterprise in Outer Space" on January 9, 1982 during the Annual Meeting of the Association in Philadelphia, Pennsylvania.

There will be a panel discussion of the "Legal Implications of Satellite Applications" during the 1982 AIAA Satellite Systems Conference to be held March 7-11, 1982 in San Diego, California.

DOE/NASA Satellite Power System Concept Development and Evaluation Program, The Final Proceedings of the Solar Power Satellite Program Review, April 22-25, 1980, Lincoln, Nebraska (U.S. Dept. of Energy, 1980). Pp. 678, $33.00.

The concept of a Solar Power Satellite (SPS), which is to place a satellite in orbit to capture sunlight, change the energy into an appropriate form for transmission to earth and introduction into a terrestrial power grid, is one which intrigues many people. The Concept Development and Evaluation Program was created by the Department of Energy (DOE) in cooperation with NASA to study the cost and benefits of the SPS. A program review of the SPS was held at the University of Nebraska sponsored by the Department of Energy and NASA and coordinated by the Kenneth E. Johnson Environmental and Energy Center of the University of Alabama in Huntsville. This book is a report of the final proceedings of that program review.

The review is divided into four areas, namely, systems definition, environmental aspects, political and economic effects, and comparative assessment. The part on political and economic effects deals with military implications, internationalization, energy implications, insurance, and other legal and political aspects. According to the report, important political and legal consequences arise in relation to: 1. Access to resources, 2. Environmental impacts, 3. Industrial operation (traffic regulation and safety), 4. Liability and 5. Organization (international bodies).

This book includes information that will be of interest to a wide range of people and organizations, such as engineers, the power industry, environmentalists, politicians, lawyers and others because of the world-wide implications and likely impact of SPS on virtually everyone.

Settlement of Space Law Disputes, edited by Karl-Heinz Böckstiegel (Carl Heymanns Verlag, Köln, 1980), pp. IX, 415.

This book contains the Proceedings of an International Colloquium held in Munich, Germany in September of 1979.

The Colloquium was divided into four categories which were further broken down into several topics. Under the first category, Dr. Hans von Mangoldt, Chair of Public and International Law, University of Tubingen, discussed "Methods of Dispute Settlement in Public International Law," and Aron Broches, Secretary General, International Centre for Settlement of Investment Disputes, Washington, D.C., elaborated on "Experiences from the Practice of an International Arbitral Tribunal."

The second category on Rules for Dispute Settlement in Present Space Law contained three topics. Professor Stephen Gorove, of the University of Mississippi Law Center addressed "Dispute Settlement in the Liability Convention," Mr. G. Bourely, Legal Advisor, European Space Agency, spoke on "Settlement of Disputes under the Convention for the Establishment of a European Space Agency," and Sylvia Maureen Williams, Professor of International Law at the University of Buenos Aires, presented a paper on "Dispute Settlement According to the Convention."

Under the third section, Rules and Experiences in Comparable Fields of the Law, Michael Milde, Principal Legal Officer and (acting Director, Legal Bureau), ICAO Secretariat, Montreal, discussed "Dispute Settlement in the Framework of the International Civil Aviation Organization (ICAO)." Professor Bin Cheng, of the University of London addressed "Dispute Settlements in Bilateral Air Transport Agreements" and Gunther Jaenielse, Legal Advisor to the German Delegation at the Law of the Sea Conferences, President of the German National Branch of the International Law Association, elaborated on "Solutions for dispute settlement procedures elaborated by the Conferences on the Law of the Sea."

In the fourth category, Perspectives for Further Development of Space Law, Professor Aldo Armando Cocca of Argentina, focused on the topic "To What Extent are Further Procedures for the Settlement of Space Law Disputes Considered Necessary?" Karl-Heinz Böckstiegel, Director of the Institute of Air and Space Law, University of Cologne, elaborated on "Which Method of Dispute Settlement in Space Law Can be Considered Being the Most Effective and Which Has the Greatest Chance of Realization?" Eilene Galloway, Vice President of the International Institute of Space Law, discussed "Which Method of Realization in Public International Law Can Be Considered Most Desirable and Having the Greatest Chance of Realization?" Dr. Nicholas M. Matte, Director of the Institute of Air and Space Law, McGill University, Montreal, addressed "What Steps Should be Taken in Research and Practice in Order to Achieve Progress?"

The book contains a bibliography—including relevant materials and texts—and references. This reviewer agrees with Karl-Heinz Bockstiegel, the editor who says in the preface that, "[t]he Munich Colloquium brought together top experts from different parts of the world who . . . produced what was certainly the widest and at the same time deepest research and insight ever made on the subject so far."

Life in the Universe: The Ultimate Limits to Growth, AAAS Selected Symposium, edited by William H. Gale (Westview Press, 1979), pp. 121.

This book contains a report of the proceedings of the symposium of the American Association for the Advancement of Science. One point the participants obviously intended to stress was that our role in space should be viewed with a much more optimistic approach.

Jesco von Putt Kamer, program manager of Space Industrialization Studies in NASA's Advanced Programs Office of Space Transportation Studies, discussed "Humanization Beyond Earth: The New Age of Space Industrialization," pointing out the importance of the Space Shuttle Orbiter in reducing the cost of space transportation and thereby increasing the opportunity for the commercial use of outer space.

Brian O'Leary, research physicist at Princeton University, addressed the "Limits of Growth Implication of Space Settlements," including the potential of extracting resources from space to be used here on earth and the possibility of growing food in space-manufactured facilities.

Leonard David, director of student programs at the Forum for the Advancement of Students in Science and Technology elaborated in his paper on "Space Exploration: Prospects and Problems for Today and the Future," including the possible conflict over resources, pollution and military uses of space.

William A. Gale, member of the Statistics and Data Analysis Research Department at Bell Telephone Laboratories and Gregg Edwards, program manager at the National Science Foundation for the program New Knowledge for National Productivity, discussed "Models of Long Range Growth," suggesting that we will only reach our limit to growth when we encounter areas of space in which the resources have been developed by other intelligent beings.

Michael Michaud, U.S. Department of State focused on "Improving the Prospects for Life in the Universe," reviewing several methods that would improve our chances of living beyond earth, including allocation of resources, a backing by society, political support and, most importantly, an educational boost.

This book demonstrates some extremely important qualities such as optimism, dedication, organization and a continuing persistence in seeking perfection if our endeavors in space are to be successful. The contributors to this book are very optimistic but fortunately they do not lose sight of reality.

Der Weltraumvertrag vom 27. January 1967, by von Adrian Bueckling. (Published in Studies in Air and Space Law, vol. 2, edited by Karl-Heinz Böckstiegel), Carl Heymanns Verlag, Köln, 1980. Pp. VIII, 82. DM 40.

This study by von Adrian Bueckling, a frequent German writer on space law, deals with the 1967 Outer Space Treaty. The substantive part of the study is divided into two areas—the brief history and the main ideas of the Outer Space Treaty. In discussing the basic principles, the author focuses on the exploration and use of free space and celestial bodies, especially on the military use of outer space and celestial bodies and the civilian use of free space and the moon and other celestial bodies. Additional sections deal with the common interest clauses of the Outer Space Treaty (arts. 1, 3, 4, 9 and 11), and the legal status of movable and immovable space objects.

The monograph is accompanied by a bibliography and extensive annotations to both German and English materials.

RECENT PUBLICATIONS

A. Books

B. J. Bluth & S. R. McNeal (eds.), Update on Space, Volume 1 (National Behavior Systems, 1981).

K. W. Gatland, The Space Shuttle Handbook (Hamlyn Pub. Group, 1979).

W. C. Hayes, Jr. (ed.), Space—New Opportunities For International Ventures (American Astronautical Society Publication, 17th Goddard Memorial Symposium, March 28-30, 1979, Washington, D.C. 1980).

T. A. Heppenheimer, Colonies In Space (Warner, 1980).

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