CURRENT ISSUES OF SPACE LAW BEFORE THE UNITED NATIONS

*S. Neil Hosenball**

The purpose of this presentation is to provide some understanding of the United Nations' activities in the area of space law not only from the viewpoint of what has been accomplished today, but also from the point of view of what will be accomplished in the future. It might also be worthwhile to explain briefly the organization of the United Nations Committee on the Peaceful Uses of Outer Space and its two subcommittees. One is a Scientific and Technical Subcommittee; the other is a Legal Subcommittee.

Actually, 1973 has been an anniversary of a sort. Sputnik was launched 15 years ago. The United Nations Committee on the Peaceful Uses of Outer Space (COPUOS), first as an *ad hoc* committee, came into existence in 1958.[1] In addition, NASA last year celebrated its 15th anniversary.

WORK OF THE OUTER SPACE COMMITTEE

Let me turn first to what the Committee has accomplished so far by way of treaties.

We have three treaties in force at the present time. These are the products of the Legal Subcommittee. They are: The Outer Space Treaty of 1967,[2] the Agreement on the Rescue and Return of Astronauts and the Return of Space Objects,[3] and the Liability Convention.[4] Interestingly enough, the Liability Convention became binding on the two

---

*Deputy General Counsel, National Aeronautics and Space Administration, Washington, D. C.; member of the U.S. Delegation to the Legal Subcommittee of the United Nations Committee on the Peaceful Uses of Outer Space. The article is in part based on research material prepared by Pierre M. Hartman and Alvin S. Bass, Attorneys, NASA, Washington, D. C. The views expressed herein are those of the author and do not necessarily represent the views of NASA or the U.S. Government.

[1]U.N. Res. 1348 (XIII) of Dec. 13, 1958. U.N. Res. 1472 (XIV) of Dec. 12, 1959, created the present Committee on the Peaceful Uses of Outer Space.

[2]Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, Including the Moon and Other Celestial Bodies, signed January 27, 1967, [1967] 18 UST 2410, TIAS No. 6347 (hereinafter referred to as the "Outer Space Treaty").

[3]Agreement on the Rescue of Astronauts, the Return of Astronauts, and the Return of Objects Launched into Outer Space, signed April 22, 1968, [1968] 19 UST 7570, TIAS No. 6599 (hereinafter referred to as the "Rescue and Return Agreement").

[4]Convention on International Liability for Damage Caused by Space Objects was signed by 40 nations on March 29, 1972, and entered into force for the United States in 1973, 68 Dept. St. Bull. 949 (1973) (hereinafter referred to as the "Liability Convention"). For text, see also 1 J. Space L. 86 (1973).

major space powers in 1973 when the instruments of ratification of the USSR and the U. S. were deposited on October 9, 1973.[5]

The Committee on the Peaceful Uses of Outer Space is composed of 28 member states.[6] Its makeup represents all the major blocs and interests that exist in the United Nations as a whole. The permanent members of the United Nations Security Council (except for the People's Republic of China), the United States, France, Great Britain, and the Soviet Union, are members of the Committee on the Peaceful Uses of Outer Space. There is the Eastern bloc group: Bulgaria, Czechoslovakia, Romania, Hungary, Mongolia, and Poland. African nations are also represented: Chad, Morocco, Egypt, and Sierra Leone. There are some South American nations as well: Brazil and Argentina. There are also Australia, Canada, Mexico, Italy, Belgium, and Austria. Albania, Iran, Japan, India, Lebanon, and Sweden are similarly represented. So, it has a broad makeup of the space powers, highly industrialized countries, and many less developed nations as well.

There has been less controversy about activities in space, particularly about the international character of activities in space, than in many other areas of U. N. activities. Nonetheless, the function of the Legal Subcommittee (COPUOS), is not solely legal in nature. The Subcommittee not only performs the function of the drafting of the document, the treaty, the convention, the agreement, and the statement of principle; but it also performs a diplomatic function as well. The Subcommittee must concern itself not only with differing systems of jurisprudence, but also with differing political systems, differing social customs, and differing degrees of economic development, all of which in some way have to come together in a treaty that would be acceptable to at least a substantial majority of the nations of the world.

As we move into the regulation of space activities rather than the establishment of principles, the issues are becoming more economic, social and political, notwithstanding that there may be very substantial legal issues involved as well. These then become very difficult questions to resolve. So as we review the existing treaties, the draft conventions currently under negotiation, and those awaiting negotiation, we should perhaps keep in mind the identity of the issues and their classification as either economic, legal, social, or political. In some issues, there may be a substantial technological question involved. In others, humanitarian considerations emerge. The organizational system for carrying out a particular space activity may be a major topic for discussion and resolution.

---

[5]See note 4 above.

[6]In Feb. 1974 the membership of the Committee on the Peaceful Uses of Outer Space was expanded to 37 by the addition of nine new member States: Kenya, Nigeria, Sudan, Pakistan, Indonesia, Chile, Venezuela, Federal Republic of Germany, German Democratic Republic. The developing and less developed nations are thus expressing greater interest and will play a more important role in the future deliberations of the Committee.

OUTER SPACE TREATY

The Outer Space Treaty is the basic treaty in space law. It established major principles. It was a farsighted treaty. For example, Article I states that the exploration and use of outer space, including the Moon and other celestial bodies, shall be carried out for the benefit and interests of all countries, irrespective of their degree of economic or scientific development, and shall be the province of all mankind. This is an extremely far-reaching principle.

Article II states that outer space, including the Moon and other celestial bodies, is not subject to national appropriation by claim of sovereignty, by means of use of occupation, or by any other means. Thus, exploring outer space, discovering other planets give no nation a sovereign right in that celestial body.

Article IV provides that the States Parties to the Treaty undertake not to place in orbit around the earth any objects carrying nuclear weapons, or any other kinds of weapons of mass destruction, or install such weapons on celestial bodies.

These articles constitute a sample of the critical major political decisions that were embodied in the Outer Space Treaty of 1967. In all, there are some 17 articles in the Outer Space Treaty.[7]

RETURN AND RESCUE AGREEMENT AND LIABILITY CONVENTION

The Return and Rescue Agreement was a humanitarian effort. It was generally accepted that if an astronaut were to land on foreign soil, or even if an artificial satellite should land on foreign soil, everybody should assist and return the astronaut or spacecraft immediately. In return for that agreement, many States demanded a *quid pro quo*. They said that they would agree to assist and return astronauts and spacecraft, but they raised questions involving possible damage if caused to their people or property. What if a large fragment destroyed an opera house or an electrical power system? There was concern about liability and payment for such damage. The Outer Space Treaty established the principle that nations operating in outer space will be internationally liable for damage, but this provision had to be implemented by a system for the settlement or resolution of disputes that might arise. How was it going to be resolved, and what mechanism was to be used? What was to be the standard of liability: absolute liability, comparative negligence, or gross negligence? In this connection, it may be recalled that we are dealing with the jurisprudence of the Soviet law system, the civil law system, the common law system, and others with major and minor differences. However, finally in 1972, after nine years of

[7] For an excellent analysis and compilation of background data on the Outer Space Treaty, see Staff of Senate Comm. on Aeronautical and Space Sciences, S. Doc. No. 74-983, 90th Cong., 1st Ses. (Comm. Print 1967).

constant prodding by the U. N. General Assembly, consensus was reached on a Liability Convention.[8]

CURRENT ISSUES BEFORE THE U. N.

What are the current issues before the United Nations? During the past two years, the committee has been considering two draft conventions: The Draft Treaty on the Moon,[9] which was an initiative of the Soviet Union, and the Draft Treaty on the Registration of Space Objects.[10]

A. DRAFT TREATY ON THE MOON

The Draft Treaty on the Moon has 21 articles, and a great deal of progress has been made in relation to it. Basically, there are two major outstanding issues. One is the scope of the treaty itself. Should it apply only to the Moon, or should it apply to other celestial bodies as well? One concern is that if it is limited to the Moon, every two years some one will submit a treaty on Mars, then one on Jupiter, Pluto, and so on down the list of planets. The United States' position is that there is not anything in the 21 draft articles currently before the Legal Subcommittee that would not equally apply to any other celestial body within our solar system. There is nothing peculiar about the Moon that requires special treatment. While we do not know what exists in other galaxies of the universe, we know fairly well what exists within our own solar system; and so the United States has proposed that the scope of the Treaty should apply to all other celestial bodies within our solar system.

The other major issue concerns the exploration for and exploitation of lunar material and planetary resources. This is so despite the generally accepted premise that there are no lunar or planetary natural resources yet discovered that can be commercially exploited with the present technology. Why should it be such a major issue? There is a provision in the Draft Treaty on the Moon and Other Celestial Bodies calling for an agreement, when it becomes feasible to commercially exploit the resources on a celestial body, to establish how it could be best exploited in consonance with the Outer Space

---

[8]Staff of Senate Comm. on Aeronautical & Space Sciences, 92nd Cong. 2nd Sess., Report on the Convention on International Liability for Damage Caused by Space Objects: Analysis and Background Data (Comm. Print 1972).

[9]Draft Treaty Relating to the Moon, U.N. Doc. A/AC 105 (April 27, 1973). For text, see also 1 J. Space L. 170-179 (1973).

[10]Draft Convention on Registration of Objects Launched into Outer Space, U.N. Doc. A/AC 105/115 (April 27, 1973). For text, see also 1 J. Space L. 165-69 (1973).

Treaty and, in particular, for the benefit of all mankind.[11] It appears that especially the less developed nations are seeking to establish a precedent for the future. They are seeking the establishment now of basic principles about sharing resources so that they can share the benefits of any new space technology that may lead to the commercial utilization of lunar and planetary natural resources. We do not disagree with the basic principle that all nations should share in the benefits that would accrue when it becomes commercially feasible to obtain natural resources from the Moon or other celestial bodies. The proposal, however, that has been made by some of the delegations is that there should be a moratorium on any exploitation and exploration for resources until such time as the agreement concerning the allocation of natural resources and benefits to be given to less developed nations is agreed to. Until then, the only use that one could put lunar resources to would be for scientific purposes only. The net effect of such a moratorium would be to destroy any incentive for the development of the technology, either for use experimentally or for its mass production. There are other delegations trying to meet the middle point by saying that exploration should be limited to experimental and scientific use of lunar or planetary resources and should not extend to commercial endeavors. The issue remains unresolved.

B. DRAFT TREATY ON THE REGISTRATION OF SPACE OBJECTS

The second draft convention, the one on registration, would codify an existing international practice that began as a result of a General Assembly Resolution very early in the existence of the U. N. Committee.[12] All countries have generally adhered closely to reporting their space launches. The Draft Treaty on the Registration of Space Objects, like the Liability Convention, is an implementation of one of the articles in the Outer Space Treaty.[13] It appears to be more juridical in nature rather than involving any serious economic or political issues.

The only major unresolved issue is whether and how to mark space objects with a national registry indicator. Some systems of jurisprudence attach a great deal of importance to the need for registration. The French have reminded us that we register cars, ships, planes, and births. It is registration that gives something or someone a national character. France, supported by Canada, has been the prime proponent of a formalized system of registration. Other countries, however, added another requirement: a marking and identification system.

We do place our American flag and U. S. A. mark on our launch vehicles and on many of our spacecraft. They have, however, been pressing for a marking or identification system which would provide for the immediate identification of nationality of an object

---

[11] *Supra* note 9, at Article X.

[12] General Assembly Resolution 1721 B (XVI), adopted unanimously on December 20, 1961.

[13] Outer Space Treaty, *supra* note 2, at Art. VIII.

upon inspection. There is one difficulty, however, with such a proposal, notwithstanding that it sounds very logical.

If a space object can cause major damage, why do we not set up a system of identification? It would be very expensive and would require requalification of hardware; but more important, we think it is unnecessary. The best scientific and technical talent in this country, as well as in other countries, tell us that it is not necessary because there are other methods of identifying the original of a space fragment. The United States keeps track of space fragments in orbit. It keeps track of when the object leaves that orbit, and it keeps track of major changes in the orbit. In addition, our scientists and engineers tell us that through metallurgical processes one should be able to identify the nationality of a piece of metal that survived because of the differences in manufacture, in the materials and ores used. From a legal standpoint, marking parts may be the best evidence; but we do not think it is technically or economically feasible since other equally effective methods of proof of origin are available.

C. OTHER ISSUES BEFORE THE OUTER SPACE COMMITTEE

There are other interesting issues pending before the Committee on the Peaceful Uses of Outer Space, although they are perhaps not likely to be resolved in the immediate future. One is the use of direct broadcast satellites, the second is the definition of outer space, and the third is the remote sensing of the earth by satellites. Direct broadcasting and remote sensing enter the sphere of detailed regulation of space activities and bring into clear focus the social, economic, and political differences among nations in addition to some important legal issues.

(a) DIRECT BROADCAST BY SATELLITES

The reference here to direct broadcast by satellite means broadcast into somebody's home radio or home TV. We do have communications satellites that return signals to earth into large antennas and then into other means of distribution of the signal, either through cable or through antennas that cover regional areas; that is not what is meant by direct broadcasting. Direct broadcasting is used here in the sense of putting something into somebody's home in a meaningful way, such as an actual TV program or a radio program. Thus, the experiment that the United States will be conducting very shortly in cooperation with the Indian Government—where signals will be sent to the ATS (Applications Technology Satellite) satellite which will then be returned to community antennas—is not a direct broadcast satellite system. It should be emphasized that there will be community antennas and, in most cases, they will be tied to only one TV set in the community. The cost of such an antenna is expensive, and its installation and location can be controlled within the country. It is not suggested that it will cost hundreds of thousands of dollars, but it will cost about $1,000-3,000, which is much more expensive than what a mass market would accept. India is controlling the programming for this experiment.

The concern over direct broadcasting is in this program control area. Some nations are concerned that through the use of direct broadcast satellites a nation may be propagandized without its consent, and programs may be sent that are foreign and disruptive to their culture. The concern on the part of many of these countries is not counterbalanced at all, so it appears, by a dedication to the principle of free flow of information across national boundaries, which has become a major issue in the world today. With its strong tradition of and commitment to the principle of the free flow of information, the United States is seriously concerned that this principle will be compromised and eroded by any international agreement that restricts the free flow of information. At the same time, the less developed and developing nations have legitimate concerns over how this new space technology can affect their countries. The political, social, and economic considerations are obvious. The solution is not.

(b) BOUNDARY BETWEEN AIR SPACE AND OUTER SPACE

The question of locating the boundary between air space and outer space will probably not be resolved for many years. While outer space, as previously indicated, is not subject to national appropriation by claim of sovereignty, we have questions of national sovereignty involved because we do have international conventions dealing with air space. The boundary does have some obvious significance, but there are many and conflicting approaches to its definition. Some of these approaches involve highly technical considerations. We have had 15 years of space exploration, and in practice it has been possible for space activities, as well as the development of space law, to take place without resolution of the boundary question.

(c) REMOTE SENSING FROM SPACE

Remote sensing is not a new development. It has been conducted by means of aerial photography for many years. Remote sensing from spacecraft has been carried out since the earliest days of the space program. The early Applications Technology and Nimbus satellites were equipped with remote sensing devices, and remote sensing was done both by hand-held cameras and by automatic systems from Mercury, Gemini, and Apollo spacecraft. The Earth Resources Technology Satellites, the first of which (ERTS-1) has been in orbit since July 1972, are based on the design of the Nimbus meteorological satellites, which have been successfully returning pictures of the earth's weather state since 1965.

Remote sensing for the purpose of the present discussion may be defined as the investigation of the characteristics of an object without touching or changing it in any way. In the case of remote sensing of earth resources by satellite, it is the earth and its environment whose characteristics are to be explored by the detection and examination of emitted or reflected natural electromagnetic radiation.

All objects, including plants, animals, rocks, metals, liquids, and all other materials

emit or reflect electromagnetic radiation of characteristic wavelengths.[14] The most familiar type of electromagnetic radiation is perceived as light, the visible portion of the spectrum. The human eye is a type of remote sensor. An ordinary optical camera is also a remote sensor—one that has the additional capability of recording visible light as a permanent image on film.

The visible wavelengths constitute only a small portion of the total electromagnetic spectrum. Electromagnetic radiation of wavelengths progressively longer than the visible spectrum includes infrared, micro, and radio waves, while those progressively shorter include ultraviolet, x-ray, and gamma radiation. Just as the eye and an ordinary camera can sense visible radiation there are systems used in aerial and satellite sensing which can detect and record emitted electromagnetic radiation over other portions of the electromagnetic spectrum. Many objects and substances radiate and reflect multiple patterns simultaneously in different parts of the spectrum. These patterns may give much information which is not available about an object from the visual spectrum alone. Infrared sensors can measure thermal characteristics, for example.

Sensors under investigation for use in NASA's Earth Resources Survey Program include photographic film cameras, television systems, multispectral scanners, thermal mapping scanners, radar imaging systems, and microwave radiometers. For the purposes of the present discussion, however, it is sufficient to say that all these devices basically measure and record the radiation emitted or reflected from any scene or object.[15]

After being gathered, either in image or digital form, the data must be reduced and analyzed to be useful. From a legal standpoint the process need not concern us, except to note, first, that it is complex and difficult; secondly, if the program lives up to expectations, it will eventually yield great quantities of useful information. Remote sensing by satellite has potential utility, in part, because of its unique ability to provide repetitive, synoptic views of the earth. ERTS-1 for example, is able to scan ground scenes approximately 100 miles square and to repeat the scan over the same geographic location every 18 days under the same sun-angle conditions. Continuous earth resources surveys by satellite may provide the basis for a large scale inventory of natural resources, and for obtaining presently unavailable environmental information. It is expected that satellite-collected data will find application in topography, cartography, geology, geography, hydrology, agriculture, marine resources, land management, oceanography, and many other fields. It already is apparent that remote sensing will provide much new information of assistance in surveying and managing the earth's environment, including the identification of major geological features, the assessment of hydrological problems, such as snowpack and runoff conditions, the determination of the condition of range land

---

[14] "The Earth Resources Survey Program," address by Leonard Jaffe, former Deputy Administrator for Space Science and Applications, NASA; International Earth Resources Survey Workshop, University of Michigan, May 3, 1971.

[15] *Id.*

and agricultural crops, and the study of erosion patterns and changes in coastal areas.[16]

Since the launch of the first Sputnik in 1957, there have been artificial satellites orbiting the earth continuously. The satellites have been of many types, and they have been launched for varied purposes, including communication, meteorology, and navigation. They have been equipped to sense, record, and transmit to earth many kinds of data for analysis. Early satellites carried cameras to photograph such varied subjects as cloud formations and geographical features. These early activities were well publicized.

Artificial earth satellites have been overflying the territory of all countries since the advent of the Space Age. While the first satellite used in the Earth Resources Survey program (ERTS-1) is concentrating on the North American continent, it acquires data from many regions of the globe during each 18-day cycle of its orbit, and overflies the entire globe except for small areas near the poles. The Skylab missions have also involved the study of earth resources, including the use of Earth Resources Experiment Packages (EREP) developed by investigators from many other countries in addition to the United States.

Since 1958, more than 5,000 space objects, most of which have been satellites, have been launched by or on behalf of some 83 nations and international organizations[17] acting either alone or in concert. The overwhelming majority were launched by the United States and the Soviet Union.

Many cooperative agreements for space activity have been entered into. During the period 1958 to 1973 NASA entered into some kind of cooperative arrangement with no fewer than 94 countries and international organizations. Through weather satellites, which photograph cloud formations and record surface temperatures and other weather features, over 70 countries have taken part in and shared the benefits from gathering weather information directly from U. S. satellites.[18]

In view of the wide attention satellites and other space vehicles launched thus far have received, it is especially significant that no country has made any international protest based on an issue of sovereignty or inconsistency with the principles of international law.[19] While questions have been raised about some aspects of future earth sensing systems from space, there have been no diplomatic protests in which any state has

---

[16]See *4th Annual Earth Resources Program Review* (5 Vols.), NASA-MSC Publication 05937 (Jan. 1972).

[17]NASA, Office of Public Affairs (Goddard Space Flight Center), "Satellite Situation Report," Vol. 11, No. 8 (Aug. 31, 1971).

[18]For a summary of NASA's international programs and cooperative activities, see NASA, Office of International Affairs, "International Programs" (Jan. 1973).

[19]Brooks, New Developments in Earth Satellite Law, 65 Nw. U. L. Rev. 759 (1970) at 772 and citations.

alleged that violations of its sovereignty or other rights have in fact occurred. Since remote sensing in a country's airspace would have been such a violation if conducted without permission, it may safely be concluded that States have not regarded their sovereignty as extending to the altitude of orbiting satellites.

There have been numerous expressions of approval and encouragement of satellite and space ventures by the leaders of many nations of the world, including the USSR, and the United States.[20] Even prior to the Outer Space Treaty, the statements of these nations supported free access to space, free flight, and free exploration as a right capable of being exercised by all nations on an equal basis. These principles were first embodied in the "Declaration of Legal Principles Governing the Activities of States in the Exploration and Uses of Outer Space" of the United Nations General Assembly.[21] The inclusion of the principles in the Outer Space Treaty confirms their important place in international law.

Although remote sensing by earth satellites is not new, it is still in its technical infancy. NASA's ERTS program is designed to explore its further possibilities. Nevertheless, from the standpoint of international customary law, the legal principles applicable to ERTS are already established. An ERTS satellite is nothing more than a conventional satellite equipped with cameras and other sensors to collect and transmit earth resources data. Resource-sensing satellites are peaceful and are in accord with international law. They possess a potential of an order of magnitude unimagined a few years ago for contributing a wealth of data to man concerning his environment.

Article I of the Outer Space Treaty[22] has direct applicability to remote sensing of earth resources by satellite. It states first that outer space activities are to be carried out for the benefit and in the interest of all countries, and that space is the province of all mankind. It goes on to declare:

---

[20]The former Secretary General of the United States, Dag Hammarskjold, stated the following in a public address, delivered in 1958:

> "The precedents which have been set during the International Geophysical Year would seem to indicate tacit acceptance that outer space, as distinct from air space, is *'res communis'* at least when used for such joint scientific purposes as those of the International Geophysical Year. That means that outer space has been considered as belonging to no one, and as not being subject to appropriation or to sovereignty. In that respect a parallel might be drawn with the high seas, which, likewise, are considered as not capable of appropriation."

"The United Nations and Outer Space," 1961 *Senate Symposium* 263, cited in Morenoff, World Peace Through Space Law 182 (1967).

[21]U.N. Gen. Ass. Res. 1721 (XVI), adopted on Dec. 20, 1961.

[22]See Outer Space Treaty, *supra* note 2.

> "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."

Article III states:

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

The Outer Space Treaty thus provides unambiguous recognition of the use in accordance with international law of satellites in outer space. Indeed, the treaty states that space activities will be carried out in a nondiscriminatory manner to confer benefits on an international basis.

In order to establish the legality of a data collection program, it is necessary to ensure that the act of collection itself is peacefully conducted. Earth resources sensing satellites are peaceful in nature. They carry out systems specifically designed to collect and transmit data from which can be derived information about the earth's resources and its environment. They carry no weaponry and are entirely nonaggressive in nature.

There are many non-treaty international agreements in effect which reflect a broad consensus on the legality of remote sensing activity. In January 1971, NASA and the Academy of Sciences of the USSR held discussions in Moscow on space cooperation. The results included an agreement[23] to undertake a number of cooperative studies with exchange of data and to conduct further discussions regarding programs of coordinated study and exchange of information concerning the earth and ocean surfaces by means of space as well as conventional technology.

The United States has also entered into cooperative arrangements with a number of other countries, including Brazil, Mexico, and Canada for the implementation of earth-sensing experimentation. In addition, as of January 1, 1973, 37 countries and two international organizations have proposed ERS investigations, which have been agreed to and will be carried out cooperatively with the United States in the ERTS program.[24] In each of these cases, a sponsoring foreign Government agency committed itself to the public dissemination of the data to be collected over the surface area of interest.

Custom was for a long time the basic method by which rules and principles of international law were established. Apart from treaty and other forms of express

---

[23]Confirmed by exchange of letters, NASA and Soviet Academy (NASA Announcement, 31 March 1971). For text see 10 Int'l Legal Materials 617 (1971).

[24]See "International Programs," *supra* note 18.

agreement, it remains the chief method. Treaties and other formal expressions of law are often intended principally to record or codify existing customary law.[25]

Customary law is based on the presumed or tacit consent of nations. The rules of navigation and the prohibitions against capture of vessels in peaceful maritime commerce are examples of customary law which have become established over the years. The U. S. Supreme Court, in holding that such rules were a part of the law of the United States, states:

> "Undoubtedly, no single nation can change the law of the sea. That law is of universal obligation, and no statute of one or two nations can create obligations for the world. Like all the laws of nations, it rests upon the common consent of civilized communities. It is of force, not because it was prescribed by any superior power, but because it has been generally accepted as a rule of conduct. . . . And it is evident that unless general assent is efficacious to give sanction to international law, there never can be that growth and development of maritime rules which the constant changes in the instruments and necessities of navigation required."[26]

It is universally accepted that custom is a valid and established method for the creation of rules of international law[27] and is cited as such by the Statute of the International Court of Justice.[28] Although the principle is clear, difficulty may arise in determining whether a specific practice has risen to the status of customary law.

Two elements are generally agreed upon as required for the formation of international customary laws: usage and *opinio juris.*[29] Usage refers to the actual practice of states which is carried on with such consistency that definite and clear expectations concerning normal conduct among nations are thereby created. *Opinio juris* represents the conviction of those applying and assenting to the practice that it is legal and just. Fulfillment of the condition of usage generally requires: (a) a practice, whether by positive act or omission, within the ambit of international relations; (b) that the practice be sustained without significant variation; (c) that it be accepted by the overwhelming majority of the nations concerned (universality of acceptance is not required, a majority being sufficient so long as there is no major or significant dissent); and (d) that the foregoing attributes be developed over a sufficient period of time to establish a firm basis for the expectations of nations in their relations.[30]

---

[25]Pollock, The Sources of International Law, 2 Colum. L. Rev. 511 (1902).

[26]The Scotia, 81 U.S. (14 Wall.) 170 at 187-8 (1871).

[27]M. McDougal, H. Lasswell & I. Vlasic, Law and Public Order in Space 116 (1963).

[28]The Statute is reprinted in full in 2 Schwartzenberger, A Manual of International Law 733 (4th ed., 1960).

[29]Kunz, The Nature of Customary International Law, 47 Am. J. Int'l. L. 662 (1953).

[30]*Id.*

Historically, an extensive period of time was required to incorporate a practice or principle into the body of customary international law. This was largely due to the slowness of communication among nations and the relative paucity of international transactions in general. A course of conduct can give rise to the immediate need for nations to express their consent or nonconsent, and today such expression can be communicated instantaneously. Another reason that customary international law can evolve much more rapidly today is the existence of international forums, such as the United Nations, for the discussion of international practices and for full debate of the issues.

The *opinio juris* and recognition of this usage, as expressed in many scholarly writings and in the many cooperative arrangements for space programs, appear to have clearly established remote sensing as a peaceful activity recognized under customary international law.

The remote sensing of earth resources by satellite is entirely in accordance with international law. It is an elaboration of activity initiated in previous space programs and is not a departure from the past. It has been sanctioned by international custom and practice. Not only is it lawful under the Outer Space Treaty, but also remote sensing of earth resources is intended to help fulfill some of the very purposes of the Treaty. It is an entirely peaceful activity. Its intended purpose is to study the natural environment and resources of the earth in order to enhance man's capability to protect and conserve both while making more efficient and safer use of the earth's resources. The beneficial possibilities suggested in this paper are only a beginning. The promise of future benefits from superior knowledge of earth's environment and resources has encouraged interest and study by the United Nations and by broad multinational participation in current remote sensing programs.

The National Aeronautics and Space Administration has conducted all of its program since the beginning of the space age on an open and benefit-sharing basis. This tradition, framed in the National Aeronautics and Space Act of 1958,[31] has been equally applied to NASA's earth resources and environmental remote sensing programs, and is fully consistent with the provisions of the Outer Space Treaty previously discussed. To retreat now to a more restrictive approach, particularly in an area of space applications that shows great promise, is a step in the wrong direction, and it would do serious damage in the long run to the international community of nations. There are regional and global problems that cry for attention, and they can be assisted through the use of this new technology. Pollution, floods, earthquakes, weather, and water resources are no respecters of national boundaries. Neither is it technically feasible now nor in the foreseeable future to shape the reception capability of earth resources and environmental remote sensing to political boundaries. The wide scope of the area covered on each pass and the imagery obtained are for the most part regional in character. States should therefore recognize that the great benefit of remote sensing is not limited to *national* resources and the contribution is in the areas of *natural* resources and the environment. As to *national*

[31] Act of July 29, 1958, Public Law 85-568, 72 Stat. 426, 42 U.S.C. 2451, *et seq.*

resources that are identified with the assistance of remote sensing data, these resources are within the sovereign control of the nation within whose borders they lie. Any exploration, extraction, or development after their identification, would be wholly subject to the terms and conditions imposed by that sovereign state. This being true, and in light of growing shortages of mineral resources, resources which remain undiscovered will be of no benefit to either the state within whose borders they lie or to any other state which, by purchasing such resources, could convert them into products that could help raise the world's standard of living, particularly of the less-developed and developing nations.

The United Nations has expressly recognized the great potential benefit of remote sensing from space, particularly to the developing countries and in the preservation of the environment. The Scientific and Technical Subcommittee of the Committee on the Peaceful Uses of Outer Space cited such benefits, and recommended the convening of a Working Group on Remote Sensing of the Earth by Satellites. This decision was welcomed and approved in 1971, by the General Assembly in its Resolution 2778 (XXVI). The Working Group's areas of study include the following aspects of remote sensing systems: technical development, user needs, social and economic benefits, legal implications, and organization requirements.[32]

CONCLUSION

It is apparent that the Outer Space Committee has accomplished a great deal in the past 15 years. It is equally evident that there is much remaining to be done with many important issues to be resolved in the years ahead. The Committee has proceeded, and may be expected to continue to proceed, in an orderly and constructive fashion to reach consensus on workable and acceptable solutions or approaches to many of the problems and issues that have been discussed in this paper. Though others may disagree, the development of outer space law has kept pace with space activities and technology. It is this writer's conviction that the existing widespread international cooperation in space activities, legal as well as scientific, will continue to grow and produce substantial additional benefits for all mankind.

---

[32]For a review of the role of the U.N. Working Group, see F. Fiorio, The United Nations and The Remote Sensing of Earth Resources, House Comm. on Science and Astronautics, January 26, 1972, H.R. Doc. No. 71-746, 92nd Cong., 2nd Sess. (Comm. Print, 1972).