



# NEWS RELEASE

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Before the Section of International and Comparative Law  
American Bar Association

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"The Future of Manned Space Flight,  
and the 'Freedom' of Outer Space"

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Since the beginning of the Space Age -- which, after all, is less than five years old -- we have been hearing much about the need for "freedom" of outer space. The universal appeal of the idea was demonstrated most forcefully when the United Nations General Assembly adopted its resolution on outer space last December without a single dissenting vote. You will recall that the resolution sounded the note of freedom loud and clear. It commended to the member States "for their guidance" the principle that "outer space and celestial bodies are free for exploration and use by all States in conformity with international law and are

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not subject to national appropriation."

Ambassador Stevenson, in his statement in Committee I of the General Assembly on December 4, 1961, in support of the resolution, referred to the values of freedom in these words:

"Freedom of space and celestial bodies, like freedom of the seas, will serve the interest of all nations. Man should be free to venture into space on the same basis that he has ventured on the high seas -- free from any restraints save those imposed by the laws of his own nation and by the rules of international law, including those imposed in the United Nations charter."

Three months later Ambassador Plimpton, after referring to the orbital flights of Colonel John Glenn and of the Soviet astronauts, said to the Committee on the Peaceful Uses of Outer Space:

"It is up to us to insure that the freedom of space first enjoyed by those intrepid explorers will remain unchallenged for all who follow them."

It is my thesis this morning that if we are to achieve the goal so clearly enunciated by our spokesmen in the United Nations -- namely, that man should be able to enjoy the freedom to explore space just as he has been free to venture forth on the high seas -- international law must

recognize the need for a realistic ceiling on the "closed" space which is under the exclusive unilateral control of each underlying State. If we are serious about the freedom of space exploration, we must not underestimate the area of "free" space which is required for that activity.

Since time is short this morning, I am merely going to state briefly certain conclusions about the existing legal situation which give rise to the problem, without spelling out the arguments supporting them.

In the first place, we start with the universally accepted proposition that national territory is three dimensional -- that it extends vertically as well as laterally and that it includes the "air space" above land and territorial waters. At the present time, the vertical extent of territorial sovereignty has not been precisely delimited; that is, there is no agreed legal definition of the exact upward extent of the territorial "air space."

International law recognizes the right of each nation to exclude from its territory, including its "air space," any object or activity whatsoever, regardless of its use

or purpose. This power of exclusion has been modified in the maritime field by the right of innocent passage accorded certain vessels under certain conditions, but no analogous right of innocent passage is recognized with respect to the territorial air space. It is on the foundation of this unqualified power of exclusion residing in the territorial sovereign that the various nations have erected the present structure of bilateral and multilateral aviation agreements which determine the conditions on which entry into and the use of a nation's air space are permitted.

The extension of territorial sovereignty laterally into the sea and vertically into the atmosphere has been determined historically by a combination of national interests, the chief of which have been security and commercial regulation, in that order. Now it should be apparent that the higher we go, the less significant, from the standpoint of the security of the underlying State, is mere "overness." The disturbing or threatening nature of an activity in outer space does not depend upon its being directly over

the territory of the nation affected. This factor, which is of the utmost importance in considering the legal implications of space activities, was not present, or at least not generally recognized, at the time the present rule of territorial sovereignty in the "air space" was developed in the aftermath of World War I.

In the light of these facts, it is evident that the security interests of the underlying States would not be adequately served by the vertical extension of territorial sovereignty to very high altitudes. Rather, what is required is some form of international control directed toward specific space activities, regardless of the location of their occurrence. The United States disarmament proposals quite clearly reflect this approach to the problem. Nevertheless, we cannot escape the fact that there presently exists the rule of exclusive control of the territorial air space to some undefined altitude.

Now let us look at the actual behavior of States beginning with the launching of the first Sputnik in October, 1957. Since that time, numerous earth-orbiting satellites launched by both the United States and the USSR have repeatedly passed over the land and territorial waters of

every nation on earth. No permission was sought in advance by the launching State, none was expressly given by any other State, and not a single protest has been registered by any State. The only conclusion that may reasonably be drawn, I believe, is that the nations have not regarded territorial sovereignty as extending as high as the point at which the orbiting of these satellites has occurred.

It was on the basis of this experience and this apparent consensus that the United Nations General Assembly proclaimed last December the principle that outer space is "free for exploration and use by all States in conformity with international law." The resolution did not, however, attempt to define the realm of "outer space." In commenting on this aspect of the subject prior to adoption of the resolution, Ambassador Stevenson remarked:

"The members of the committee will note that we have not attempted to define where outer space begins. In our judgment, it is premature to do this now. The attempt to draw a boundary between air space and outer space must await further experience and a consensus among nations.

"Fortunately the value of the principles of freedom of space and celestial bodies does not depend on the drawing of a boundary line. If I may cite the analogy of the high seas, we have been able to confirm the principle of freedom of the

seas even in the absence of complete agreement as to where the seas begin."

The analogy raises some interesting questions since, despite failure to reach unanimity, the nations have striven mightily in recent years to reach agreement on where the high seas begin. Incidentally, I would prefer not to approach this problem as being that of defining "where outer space begins." The primary question is not where outer space begins but where the upward reach of the exclusive power of the underlying State ends. They may turn out to be one and the same, but then again they may not. In any event, I feel that the emphasis is somewhat misplaced when the problem is stated in terms of drawing the boundary line of outer space.

To sum up, it appears that the existing state of the law is that we have an area of space extending upward from the surface of the earth for an indefinite distance which is exclusively controlled by the underlying State -- an absolutely "un-free" area, one might say -- and above that, beginning at some undefined point, lies the "free" realm of outer space. Whether there is or should be an intermediate third realm to which the exclusive power of the

underlying State does not extend, but in which the full freedom of outer space may not be enjoyed, is an interesting item for speculation.

If we were concerned solely with the actual orbiting of spacecraft about the earth, the problem I have posed might be dismissed as a purely academic one. It becomes of practical significance, however, because all spacecraft, before injection into orbit, must first be launched through the air space. Likewise, all space missions involving re-entry and landing -- and here is where manned space flight dominates the scene -- require that the spacecraft move back through the air space on their return to earth.

It is at this point that the analogy of freedom of outer space to freedom of the seas breaks down. As Ambassador Stevenson said, the principle of freedom of the seas has been a useful and valuable one even though there has not been complete agreement "as to where the seas begin." This is because the littoral state has no problem in gaining access to the area which is universally regarded as the "high seas." Ordinarily a sea-going vessel can move directly from shore to the high seas, whether the

marginal sea be regarded as 3, 6, or 12 or more miles in width, without having to pass through the territorial waters of a neighboring State; and it can return to port in the same manner.

Manned space flight, however, presents an entirely different picture. Both the initial phase of launch and injection into orbit, and the terminal phase of manned space flight missions involving reentry and landing, are compelled to traverse considerable distances, horizontally measured, at altitudes less than that at which orbital flight occurs. Typically, the terminal phase follows a "flatter" flight path, covering a greater horizontal distance, than does the initial phase of manned space flight.

Although Project Mercury is but the first step in the exploration of space by man, its flight profile demonstrates the point. When the astronaut reaches an altitude of 10 miles after launching, he is also about 10 miles, horizontally measured, from the launching site. At an altitude of 25 miles, the horizontal distance is about 25 miles; at an altitude of 50 miles, it is still only 70 miles; and when the astronaut goes into orbit at an altitude of approximately 100 miles, he is about 575 miles from the launching site.

At the time of firing the retro-rockets which initiate reentry, the astronaut is at an altitude of about 100 miles, approximately 2,600 miles from the intended point of landing. In the first 2,000 miles after retro-fire, the astronaut comes down to an altitude of about 50 miles. While descending to an altitude of 25 miles, he moves another 550 miles horizontally, bringing him only 50 miles from his destination. Thereafter he descends very rapidly; and by the time he comes down to an altitude of 10 miles, he is over the landing site and making a vertical descent.

Although the three-orbit flights of Colonel Glenn and Commander Carpenter involved descent entirely over United States territory and the high seas, this may not always be the case. The possibilities of utilizing different orbital paths as space flight progresses are obvious.

As we proceed beyond Mercury with the Gemini and Apollo spacecraft, more extended and "flatter" reentry flight paths are clearly foreseeable. Spacecraft with certain lifting body characteristics are contemplated, providing the pilot with limited maneuverability and choice of landing area. It now appears that the manned vehicles which will be

developed over the next five to ten years will enter the atmosphere rather steeply, level out, and glide at altitudes ranging from about 25 to 60 miles for distances perhaps as great as 7,000 to 10,000 miles before landing. Inevitably, it will become necessary to know in advance whether any portion of the reentry phase of a manned space flight violates the territorial air space of another State because of the altitude at which its land or territorial waters may be overflown.

While the eventual solution of this problem will be couched in legal terms, it is nevertheless a problem of an essentially political nature. It is not a problem which will be solved on the basis of the physical characteristics of the aerospace environment or the performance capabilities of the various vehicles which aerospace technology produces. The future progress of this technology promises to blur the differences which presently exist between aircraft and spacecraft. The viewpoint of the scientist and engineer working in this field has been well expressed by the former Director of Advanced Research

Programs for NASA, Mr. Ira H. Abbott. During testimony before a Congressional committee over three years ago, he said:

"From the point of view of research no clear-cut distinction can be drawn between aeronautics and space, as may be illustrated by the experimental X-15, the latest of the research airplanes on which tests will soon start. In many respects it is an airplane. It will fly through air and must return and land as an airplane. But in many respects it will be a spacecraft. It will reach altitudes where there is not enough air to support an appreciable part of its weight and where it must be guided and controlled much as we expect future space vehicles to be controlled."

The X-15 provides a good starting point for an appreciation of the problems involved in trying to draw a line on scientific or technological grounds between air space and outer space, or aeronautics and astronautics. Although the X-15 is an aircraft in that it has wings and is supported in flight by aerodynamically-generated lift, it is also capable of semi-ballistic flight. Its maximum altitude for sustained level flight is around 125,000 feet at a speed of about MACH 7. In semi-ballistic flight, however, it can achieve altitudes in excess of 50 miles; and at the peak of such a climb, it may be said to be in a purely ballistic flight for a short period of time.

In addition to the X-15, there is another hybrid craft under development, the hypersonic glider known as the X-20 Dyna-Soar. It is to be boosted into orbit by the Titan III launch vehicle. It will initially circle the earth at orbital velocity, gradually descending into the denser portions of the atmosphere and finally utilizing aerodynamic lift to land on the surface of the earth in the manner of an aircraft.

A long-range object of advanced research and technology in the aerospace field is to develop the capability of moving freely from earth to outer space and back again to earth with a single craft capable of utilizing aerodynamic flight, ballistic flight, and orbital flight. In the light of such a prospective development, it would be most unwise to attempt to reach a solution to the so-called "boundary" problem on the basis of the difference between the regimes of aerial flight and space flight. But even if it were possible to define a boundary between those regimes on scientific or technical grounds, it would bear no necessary relationship to the national interests which the principle of territorial sovereignty is designed to

serve, which, as I mentioned earlier, are chiefly those of national security and commercial regulation.

I think it is evident that if this problem is to be solved it will be done on the basis of an accommodation of the political interests of the States concerned, and not on the basis of scientific or technological criteria.

The principle of freedom of outer space which the General Assembly's resolution declares is, I believe, essentially the principle of freedom from unilateral control -- freedom from the power of an individual State to exclude others from the enjoyment of this great new resource.

I do not suggest that agreement on the outward reach of territorial sovereignty would assist in distinguishing between what space activities should be permitted and what should be prohibited in outer space. This is not the point. The point, rather, is that the area within which the underlying State possesses the right to "veto" the activity of another State must not be permitted to extend to altitudes which would hamper the freedom of space exploration. It is of little value to speak of the freedom of outer space

if man cannot travel freely to that realm and freely back to earth.

I must make it clear, however, that despite the foregoing considerations I am not proposing that this subject be an item of priority on the United Nations agenda or that we seek now to conclude an international agreement on this subject.

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In addition to speaking on the subject which has been announced, I have been asked to give a brief account of the meeting of the Legal Subcommittee of the United Nations Committee on the Peaceful Uses of Outer Space which took place in Geneva from May 28 to June 20 of this year.

The Legal Subcommittee had been established by action of the parent committee at its meeting in New York in March. The parent committee's meeting, in turn, had followed the action of the United Nations General Assembly on December 20, 1961, when it unanimously adopted resolution 1721 (XVI). That resolution dealt with a number of subjects relating to outer space, including the need for international organizational arrangements to facilitate the exploitation of space technology for improved weather forecasting and global communications. Of particular interest to lawyers concerned with the evolving law of outer space was the first section of the resolution, which did two things. First, it contained the following declaration of principles:

"(a) International law, including the charter of the United Nations, applies to outer space and celestial bodies;

"(b) Outer space and celestial bodies are

free for exploration and use by all States in conformity with international law and are not subject to national appropriation."

Second, it called upon the Committee on the Peaceful Uses of Outer Space "to study and report on the legal problems which may arise from the exploration and use of outer space."

The parent committee did not attempt at its meeting in New York in March to prescribe an agenda for the Legal Subcommittee. It appeared at that meeting, however, that there was general agreement that the time was right for progress to be made on two subjects: first, liability for space vehicle accidents, and second, assistance to and return of space vehicles and personnel. There was also a consensus reported by the chairman at the March meeting that the Committee and its Subcommittees would seek to accomplish their work by general agreement so as to avoid the need for voting.

It soon became apparent at the Geneva meeting that the Soviet Union was not interested in proceeding on the basis of general agreement. The Soviet delegation introduced two proposals, a declaration of basic principles and a draft agreement on assistance to and return of space vehicles and

personnel, both of which they knew, on the basis of prior consultation, were not acceptable to the United States. Following this action, the United States introduced two proposals dealing with the subjects of assistance and return and of liability for space vehicle accidents on which it had not reached prior agreement with the USSR.

The first Soviet proposal was entitled, "Proposed Declaration of Basic Principles Governing the Activities of States Pertaining to the Exploration and Use of Outer Space." It contained nine points, a number of which were virtually a repetition in somewhat different language of principles contained in the General Assembly resolution. Four of the points, however, appeared to be designed primarily to provide a basis for propaganda against certain U. S. activities. These points, which obviously involved questions of a primarily political rather than legal nature, were as follows:

"5. Scientific and technological advances shall be applied in outer space in the interests of a better understanding among nations and the promotion of broad international cooperation among States; the use of outer space for propagating war, national or racial hatred or enmity between nations shall be prohibited.

"6. Cooperation and mutual assistance in the conquest of outer space shall be a duty incumbent upon all States; the implementation of any measures that might in any way hinder the exploration or use of outer space for peaceful purposes by other countries shall be permitted only after prior discussion of and agreement upon such measures between the countries concerned.

"7. All activities of any kind pertaining to the exploration and use of outer space shall be carried out solely and exclusively by States; the sovereign rights of States to the objects they launch into outer space shall be retained by them.

"8. The use of artificial satellites for the collection of intelligence information in the territory of foreign States is incompatible with the objectives of mankind in its conquest of outer space."

The second Soviet proposal consisted of a draft international agreement on "Assistance to and Return of Spacecraft and Astronauts." The most objectionable feature of this draft substantially was Article 7, which read as follows:

"Foreign spaceships, satellites, and capsules found by a Contracting State on its territory or salvaged on the high seas shall be returned without delay to the launching State if they have identification marks showing their national origin and if the launching State has officially announced the launching of the devices found.

"Space vehicles aboard which devices have been discovered for the collection of intelligence information in the territory of another State shall not be returned."

The United States proposal on assistance to and return of space vehicles and personnel consisted of a draft General Assembly resolution which would have commended to States for their guidance the following principles:

"1. All possible assistance shall be rendered to the personnel of space vehicles who may be the subject of accident or experience conditions of distress or who may land by reason of accident, distress, or mistake, or otherwise than as planned;

"2. Space vehicles, and their personnel in the case of manned vehicles, that land by reason of accident, distress, or mistake, or otherwise than as planned, shall be safely and promptly returned to the State or States or international organization responsible for launching.

It was the United States position that the evident humanitarian interest in assistance and return and the relative simplicity of the problem made it appropriate to take expeditious action in the form of a General Assembly resolution, rather than to engage in the more time-consuming process required for bringing into force an international agreement.

The second United States proposal consisted of a draft Subcommittee resolution on the subject of liability for space vehicle accidents. It proposed to call upon the Secretary General of the United Nations to establish a

small advisory panel of legal experts drawn from various geographic areas whose task it would be to prepare a draft of an international agreement on the subject of liability. The draft resolution contained a provision commending to the advisory panel for its guidance the following principles:

"(a) States or international organizations responsible for the launching of space vehicles should be liable internationally for personal injury, loss of life, or property damage caused thereby, whether such injury, loss, or damage occurs on land, on the sea, or in the air;

"(b) A claim based on personal injury, loss of life, or property damage caused by a space vehicle should not require proof of fault on the part of the State or States or international organization responsible for launching the space vehicle in question, although the degree of care which ought reasonably to have been exercised by the person or entity on whose behalf claim is made might properly be taken into account;

"(c) A claim may be presented internationally to the State or States or international organization responsible for the launching of a space vehicle causing injury, loss, or damage without regard to the prior exhaustion of any local remedies that may be available;

"(d) The presentation of a claim should be made within a reasonable time after the occurrence of injury, loss, or damage;

"(e) The International Court of Justice should have jurisdiction to adjudicate any dispute

relating to the interpretation or application of the international agreement on liability in the absence of agreement between the States concerned upon another means of settlement."

On the question of assistance and return, there was general recognition in the Subcommittee that agreement in this area was both practicable and desirable. The United States proposal met with serious opposition only from the Soviet bloc, which insisted that an international agreement, including the objectionable features in the Soviet draft, rather than a General Assembly resolution as proposed by the U. S., was the only appropriate means of dealing with the subject.

On the subject of liability for space vehicle accidents, the Soviet bloc opposed constitution by the Secretary-General of a panel of experts and refused to endorse the principles quoted above. In an effort to meet the Soviet views, the U.S. agreed to selection of a working group on liability from among the members of the Legal Subcommittee and agreed to omission from the draft resolution of any substantive principles on liability. The USSR, however, refused to accept this procedure in the absence of agreement to proceed simultaneously with its Declaration of Basic Principles and

draft international agreement concerning assistance and return.

Near the close of the session, 15 of the 27 members of the Subcommittee present, including the United States, supported a Canadian proposal to assign the subject of liability to a working group consisting of representatives of the member States on the Committee and reflecting in an appropriate way the composition of the Legal Subcommittee itself. According to the Canadian proposal, the working group, without being given substantive guidelines, would be asked to draw up an international agreement on liability, while the subjects of assistance and return and general principles would be postponed to subsequent sessions of the Subcommittee.

The Soviet Union, however, maintained that it was not desirable for the Subcommittee to proceed with work solely on the question of liability, since the Soviet Union regarded it as a minor problem and thought the primary task of the Subcommittee was to deal with the larger issues, particularly those relating to the maintenance of peace and security. The Soviet Union insisted that even procedural action on the question of liability must be

linked to action on the other questions.

The final session of the Subcommittee concluded with acceptance of the Chairman's proposal that the Subcommittee merely transmit to the parent committee for its consideration a summary of the record of the Geneva meeting and a statement that, while no agreement had been reached on any of the submitted proposals, it was the consensus of all participating delegations that the meeting had offered the possibility for a most useful exchange of views.

During the course of the Subcommittee's meeting, various representatives suggested that the Subcommittee should examine at a later stage other legal problems arising from the exploration and use of outer space, including consideration of the list of such problems. These problems included: (1) demarcation between outer space and atmospheric space; (2) jurisdiction and law applicable to men in outer space and manned stations on celestial bodies; (3) measures to prevent interference with space projects due to scientific experiments or other space activities; (4) prevention of contamination of or from outer space and celestial bodies; (5) control over the

launching and orbits of spacecraft and artificial satellites; and (6) United Nations control of radio and television programs through outer space instrumentalities.

No date was set for the next meeting of the Subcommittee. The parent committee is scheduled to hold its next meeting in New York late this summer.