

# CONCEPTS OF SPACE LAW BEFORE SPUTNIK<sup>1</sup>

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## ABSTRACT

It is sometimes written by commentators on space law that, because there was no activity in space prior to the launch of the first man made orbital object (Sputnik-1), there was no need for space law and, consequently, no attention was given to the subject before 1957. A careful reading of the available legal literature before October 1957 not only gives clear evidence of considerable thought devoted to space law problems, but also shows that many concepts embodied in the early international instruments purporting to create space law reflected the thought of numerous precursor commentators. Many concepts contained in early declarations of principles and treaties adopted by the United Nations General Assembly after 1958 had been developed before Sputnik by visionary lawyers and legal pundits.

## EARLY SEGREGATION BY LANGUAGE

The legal and scholarly commentary on space law in the first half of the 20th century was kept segregated in many cases by curtains of language. Almost none of the commentary produced prior to 1950 contains references to other space law commentary that had been previously published in other languages. A notable exception is in the work of Vladimir Mandl (1932). Mandl's work was both comprehensive in the scope of its consideration of space law and well researched in the legal literature of Western Europe available in languages known to Mandl.

When the several national astronomical and rocket societies assembled in Paris for the first international astronomical congress, held there in 1950, the isolation of national commentaries behind the linguistic curtains separating them was irreversibly ended. Emergence of the International Astronautical Federation, with annual international meetings in London (1951), Stuttgart (1952), Zurich (1953), Innsbruck (1954),

and thereafter, provided a necessary international forum for an expanding exchange of views and information on all aspects of astronautics, including the perceived early problems of space law. In addition, the broader international distribution of legal and policy journals originating in Europe and the Americas provided documentary vehicles for international information flow.

One can readily discover the relationship between the formative space law work at the United Nations in the 1960s and 1970s and the works of the pioneering commentators, if one examines the early UN declarations of principles and the later treaties to determine how much of their content can be found in the prior literature. Although the specific wording of particular passages may or may not be identical, the basic concepts contained in many of the early declarations were long known in the literature, to at least those who were conversant with sources published in their original languages. As the 1950s proceeded, and greater international exchange of ideas occurred, many of the early sources became better known, although they were relatively rarely translated or produced in alternative publications in different languages.

A bibliography containing all of the works referenced herein follows the text of this paper. Where multiple works of a single author are referred to, the indicated date of reference differentiates the respective sources.

Neither time nor space permits the duplication and incorporation of texts drawn from the many UN declarations and resolutions that emerged in the decade from the launching of Sputnik-1, in October 1957, and the coming into force of the *Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer*

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*Space, Including the Moon and Other Celestial Bodies*, in October 1967. Herein, is a selected survey of some of the ideas, concepts and proposals that were in the legal and the general literature, and thus were available to interested law makers, before that historic day, October 4, 1957, when Sputnik-1 was launched.

#### ON THE QUESTIONS OF THE NEED FOR AND DEFINITION OF SPACE LAW

Emil Laude (1910), V. A. Zarzar (1926), Vladimir Mandl (1932), Arthur C. Clarke (1946), Alex Meyer (1952), and others, had written that new law is required to govern new juridical relationships, because of the unique aspects of spaceflight and the areas, technologies, speeds and altitudes involved. Laude (1910) and Mandl (1932) declared that a new set of legal terms with clear definitions would be required to deal with the issues of spaceflight because it is a unique pursuit. The new body of law will be called space law (or the law of outer space). In the Russian SSR, Zarzar wrote (1926) that for interplanetary travel there will be an interplanetary transport law. Mandl also observed (1932) that space law shall apply equally to all flight devices, manned or unmanned.

Mandl (1932), Meyer (1952) and C. Wilfred Jenks (1956) had declared that technology will advance continually until many capabilities will be demonstrated using spacecraft. As significant new capabilities are added, voices will be raised calling for special regulation based on genuine space law, that is on legislation which would do justice to all the peculiarities of spaceflight which come to light at that future stage of development. Oscar Schachter (1951), Cyril Horsford (1955) and Jenks (1956) declared that the unique features of spaceflight will have to be addressed by a body of space law, developed for that purpose with reference to modern international law and customary law based on accepted legal principles.

#### ON INTERNATIONAL COOPERATION IN THE USE OF OUTER SPACE

John Cobb Cooper (1951), Schachter (1951), Meyer (1952), Welf Heinrich, Prince of Hanover (1953) and Joseph Kroell (1953) had all urged that international cooperation is the only means to achieve and guarantee peaceful use of space

and travel therein. They urged that immediate steps be taken toward achieving such cooperation. Jenks (1956) wrote that it would be entirely fitting that control of space activities should be a world responsibility and every effort should be made to apply such a solution to the problem from the earliest stages of development. Jenks suggested that if legislative authority over human activity beyond the atmosphere of the Earth were to be regarded as vested in the United Nations General Assembly (UNGA), it would be possible for the UNGA to evolve progressively the necessary rules on the subject. In Jenks 1956 view, at some future time it may be necessary to have an international code to regulate space.

Horsford (1956), Cooper (1956) and H. Alberta Colclaser (1956) wrote that the political consequences of any substantial conquest of space are so far-reaching that an international body would seem to be essential, so great would be the need. It certainly should not be impossible to one create through international cooperation. David Lasser (1931) had written that an International Interplanetary Commission, comprising delegates from nations interested in spaceflight, could bring together all the talent, knowledge and resources necessary to assemble an interplanetary spacecraft and handle all the details necessary for design and production of the spacecraft. Aldo Armando Cocca (1954) had similarly urged that international cooperation be the basic approach to spaceflight so that the interests of all men would be collectively represented. As Cocca wrote: "... if the studies, plans, tests, and knowledge of today are under a universal public dominion, the vehicle that emerges from these studies should obtain the same juridical status. In which case the conquest of interplanetary space will be a conquest by humanity."

Musto (1956) wrote that the attempt of man to explore space, even if attempted by individuals, is an attempt to explore by the collectivity of mankind and will benefit the collectivity. Some basic principles are derived from this observation, wrote Musto: (1) the absolute freedom of overflight, (2) freedom of flight after landing, (3) financial support by all states, and (4) the obligation of all states to assist, protect and favor the flyer [astronaut/cosmonaut] no matter what state he represents. These principles give

rise to the need for an International Center for Interplanetary Flight, financed through the contributions of all states. As for discoveries and accomplishments, there shall be immediate devolution (*i.e.* release to governments), exclusively for peaceful and scientific purposes, of all principles and discoveries which shall be acquisitions by all states, except for the moral paternity of those who discover the new laws. [Thus, recognition of individual achievement would be preserved. -ed]

#### ON DETERMINING THE UPPER LIMIT OF NATIONAL SOVEREIGNTY

The *International Convention relating to Aerial Navigation*, adopted in Paris in October 1919, provided in Article 1 that "The High Contracting Parties recognize that every Power has complete and exclusive sovereignty over the airspace above its territory." This tenet was reflected in the *Convention on International Civil Aviation*, adopted in Chicago in 1944, Article 1 of which reads: "The contracting States recognize that every State has complete and exclusive sovereignty over the airspace above its territory." With this fundamental and universally accepted air law in place, the emergence of spaceflight raised the issue of whether or not states had a right to control flight over the airspace above their national territories. Commentators held widely varying views on this subject, but there was no lack of proposals to solve the problem.

Zarzar (1926), Mandl (1932), Clarke (1946), Cooper (1948, 1951) Schachter (1951), Heinrich (1953), Kroell (1953) and Jenks (1956) had predicted that there will be an issue as to altitude at which the international regime of spaceflight begins and replaces the concept of sovereignty over superjacent airspace. Andrew G. Haley (1955) noted that it would be repugnant to the concept of space travel to have an object traveling in space treated as if it were passing constantly through the legal jurisdictional influence of subjacent states; therefore it is necessary to have a new philosophy of law to apply to space travel. This was not an original observation. Merignhac (1914), Zarzar (1926), Mandl (1932), Clarke (1946), Cooper (1951), Schachter (1951), Heinrich (1953), Kroell (1953) and USN Rear Admiral Chester Ward (1957) had observed that state sovereignty must have some kind of limit; sovereignty cannot reach into

infinity. The consensus among these pundits was that sovereignty ends where the airspace ends.

Cooper (1948, 1951) and Kroell (1953) proposed that national sovereignty extend outward in space to the limit of the Earth's gravitational influence. In a similar vein, Catellani (1912), Eugene Korovin (1934) and Haley (1955) believed that state sovereignty radiates without limit into the heavens as far as is necessary to assure or protect the state's sovereignty over the subjacent territory. Or, as Korovin (1934) and Haley (1955) stated, it is sufficient in international law to recognize in each state, the territorial or aerial frontier of which has been violated, the undeniable right to take all necessary measures for its protection, including the seizure of the crew of an airship (in the case of a landing) to reprisals of any kind. As Catellani (1912), Zarzar (1926), Korovin (1934) and Haley (1955) contended, governments have the right to protect their citizens from threats to their safety and to the safety of their territories from above, regardless of the altitude of a superjacent flight.

There was no disagreement with the observations of Mandl (1932), Meyer (1952), Danier (1952), Heinrich (1953) and Colclaser (1956) that while transiting the atmosphere where aeronautical vehicles operate, a spacecraft, although not itself subject to aeronautical law, must operate in cognizance of and in compliance with the applicable aeronautical law. The formidable group of Mandl (1932), Schachter (1951), Meyer (1952), Heinrich (1953) and Jenks (1956) asserted with conviction that where the airspace ends, there at the same time ends that zone of sovereignty above the territory which states have mutually recognized by treaty and custom. Mandl (1932) and Meyer (1952) explained that airspace is not an independent state territory. Airspace is only qualified as an object of sovereignty as an appurtenance to the subjacent earth's surface, and when it appears desirable as a showplace in which to demonstrate sovereignty. The *de facto* resolution of this continued academic debate about upper limits on national sovereignty was clearly seen and reported by Haley in 1955, when he wrote that states might have objected to passage of planned spaceflights above their national territories; but in 1955, when the United States and the USSR announced their intentions to orbit scientific satellites

around the Earth, no nation complained or objected to the overflight of their territories. Haley noted, "The scientists benefited mankind as a whole in a field where lawyers might well have failed." Taoka (1956) noted that until recently, aircraft had not flown in the upper atmosphere, but with development of modern rocketry, questions have arisen concerning satellites passing at high altitudes in their orbits. Such overflight can be considered as not violating sovereign rights of subjacent states.

Nations chose to ignore the suggestion of Aaronson (1955) to the effect that it would be highly desirable, before the implementation of proposed earth satellite projects, to convene an intergovernmental conference of all the nations in order to define the limits of airspace. [For all intents and purposes, the matter was already practically resolved by the customary practices, *i.e.*, the manifest tolerance, of states. -ed]

#### ON REGULATING THE USE OF OUTER SPACE FOR MILITARY PURPOSES

Vladimir Mandl (1932) wrote that military considerations will present the most pertinent and most important motives for government support of spaceflight. Mandl (1932) also wrote, followed by US Army AF Gen. Henry (Hap) Arnold (1945) and Ralph A. Smith (1949), that international warmaking regulations will be expanded to cover spacecraft and these will be integrated into normal warmaking resources without anyone seriously thinking that the employment of spacecraft in warfare is to be excluded. Mandl (1932) also believed that the rules of land, sea or air warfare will be binding on spacecraft according to their use to support ground forces, or sea or air formations. In fact, Mandl (1932), Gen. Arnold (1945), and Cyril Horsford (1955) had written that outer space, as in the case of any sea area not subject to state sovereignty, would offer itself as a theater of war to anyone who wished to use it.

Opposing these early views of the inevitability of military use of outer space were Oscar Schachter (1951) and Alex Meyer (1952). Schachter wrote that it may be expected that there will be a demand that the use of outer space for military purposes will be outlawed. Meyer (1952) urged that the exploration of outer space be restricted for peaceful purposes. Kroell (1953) urged that

interplanetary travel and the use of fixed or moving space stations should not be permitted if for purposes of political domination or of war; even studies or preparations of warlike ends should be prohibited. Wernher von Braun (1952) wrote that cameras located on a space station could be focused on the Earth below; then there would be no "iron curtain" because the entire Earth could come under the observation of the space station.

Myres McDougal (1956) and R. Adm. Ward (1956) were very pragmatic in their assessments that if a vehicle in flight is believed to pose a threat to a particular nation, and if that nation has the capacity to shoot it down, that nation is going to shoot it down. Thus, there was clearly a substantial division of opinion between pundits on the one hand, who believed military use of space was inevitable and acceptable, and those on the other hand, who opposed military use and firmly recommended against it, seeking the prohibition of such use of space. It remained for that issue to be brought before an international institution with the authority to address and resolve it.

Hester (1955) wrote that overall international security would be served if the UN would draft a plan offering a basis for exploratory discussions among immediately interested states. Hester thought the UN draft should be based on a number of realities: (1) the conduct of human spaceflight is inevitable, (2) spaceflight offers a means for one nation to threaten all nations, (3) controls should avoid hazards to people and property, and (4) a unified general astronomical policy should apply to all nations. But Hester was realistic enough to observe that a number of thorny problems would have to be resolved by the UN in the process of defining a regulatory regime, including: (1) the international composition of a commission to coordinate space R&D, (2) the creation of methods to pool information and exchange experts, (3) allowing international developments while limiting private ventures, (4) establishing controls and coordination of flight operations, (5) finding means for reducing operational hazards, (6) prohibiting weapons and war-heads in spaceflight, (7) establishing penalties for defaulting actions which may:

- misapply astronautics for military uses,
- involve refusal to make required disclosures, or
- disregard agreed safeguards and procedures.

Jenks (1956) declared that there would clearly be a great advantage in vesting the necessary authority in an international body, if this should be politically practicable, but the difficulties of doing so may well be formidable, particularly in view of the relationship between the exploration and exploitation of space and the question of defense. Schachter (1956) believed that international regulation of activities in outer space is required for: (1) protection of national security, (2) the maintenance of peace, (3) enabling scientific investigations, and (4) use of resources of outer space. Schachter thought and wrote that scientific research and exploitation of outer space would best be served by a regime of free use such as applies to the high seas.

#### ON THE REGULATION OF SPACE TELECOMMUNICATION

Laude (1910), Zarzar (1926), Sterling (1954), and Cooper (1956) noted that a separate body of law is required to deal with the ownership and use of the radiomagnetic spectrum. Sterling (1954) wrote that the use of radio frequencies for transmitting to and receiving information from rockets raises technical and regulatory problems involving national and international considerations. The selection of frequencies for use in space will be affected by propagation characteristics of the frequencies involved. Although frequencies desirable for astronomical communication are not now [1954] internationally well allocated or regulated, global coordination for such uses will be important to successful use of radio. Space communication will require clear channels and agreements not to employ jamming techniques; all these requirements create the need for unprecedented cooperation and planning among nations on an international basis. Haley (1955) noted that in moving toward spaceflight, science [meaning the scientific community] and government must advance more rapidly in the field of telecommunication than in any other field. Haley also noted that substantial machinery was already in place to meet the regulatory needs in the form of the International Telecommunication Union.

#### ON LIABILITY FOR DAMAGE CAUSED BY SPACEFLIGHT ACTIVITY

Mandl (1932) wrote that liability for damage to third parties should be absolute (no fault liability)

because of the novelty of the subject, restricted familiarity with the nature of the technology on the part of the public and the courts, and the likely unexpected nature of any damage to be suffered by third parties. Mandl believed liability may be reduced if there is a contributing fault or negligence of the injured party [contributory negligence]. Mandl explained that liability for damage to the crew, a cargo owner, or other party in a contractual relationship with the operator of a spaceship should be dealt with in a manner consistent with the applicable contract. Accident insurance may cover damage to the crew or vehicle. In the absence of any special arrangements, noted Mandl, liability of the promoter to parties involved would exist only in cases of premeditation or gross negligence, because the involved parties can be said to have assumed the risks involved. Possible passenger or even cargo transportation contracts will exhibit the character of liability-free speculative contracts rather than real production contracts, accordingly the various contract points must be clarified with regard to disputes.

Mandl (1932) was of the opinion that in the case of a landed spacecraft causing damage on the ground, normally a lien should apply to the spacecraft for the damages suffered, for payment prior to the removal of the spacecraft. Provision probably will be made by the legislature that a person entitled to damages caused by an emergency landing will not be able to prohibit the removal of the spacecraft, but there will be some general salvage and rescue obligation which will permit a claim for salvage or rescue compensation as well as for damage. Liability for damage to third persons will have to be met through compulsory liability insurance, posting of bonds, or by some such means. As if endorsing all that Mandl had written, but without reference to it, Quincy Wright (1956) said that issues of liability for damage by spaceflight activity will arise early in the era of spaceflight and these issues should be resolved early. However, cautioned Wright, no state should be allowed to establish laws that cannot be enforced.

#### ON THE AUTHORITY, LOCATION, AND ELIGIBILITY TO CONDUCT SPACEFLIGHT

Mandl (1932) obviously thought a great deal about this area of concern. He wrote that an entity licensed to conduct aerial flight as its only

statutory purpose may not extend its field of activity to spaceflight on its own authority. Even in the absence of statutory direction, a spacefarer is responsible to exercise due care in dealing with an explosive and potentially dangerous vehicles, and owes a duty of prudence and reasonable care to the community in which spaceflight operations are undertaken. For example, prior to departure of a flight, the equipment (flightcraft and related ground equipment) and crew should be examined to ensure that they pass a reasonable test of capability to perform the operations contemplated. It would not be prudent to undertake a spaceflight with an untrained crew and an untried or untested vehicle.

Mandl (1932) wrote that the capability and appropriate precautions to handle explosives, high levels of electric power, flammables and installations of the flight facility should be suitable to the type of propulsion used in each case. The launch area, including the ground infrastructure, must be set up in full consideration for the overall safety. Prior to launch, the spacefarer must either provide aeronautical interests with notice to airmen of a launch operation so that aviators can avoid the launch area, or be prepared to comply with all regulations applicable to aeronautical flight while transiting the atmosphere. When a prohibited air zone is established, it must be respected by the spacefarer also, just as he must comply with the prohibitions against using cameras and using radio transmitting equipment. As a rule, national or federal authority will be the appropriate authority to regulate and license spaceflight activity.

A senior administrative board, or a ministry or agency will have to be established to handle all the regulatory requirements such as all the questions of space law, the effect on the environment of the launch area, the manifold licenses, oversight activities, crew health and readiness and spacecraft qualification and readiness, the various administrative jurisdictions and the like. The flight support organization on the ground must also demonstrate required levels of performance.

Mandl (1932) declared that the proper use of public or donated monies to support spaceflight operations must be assured through public

financial disclosure as a responsibility of the project manager. Corrupt procedures, the exhaustion of public confidence, and thereby the degradation of the whole concept of spaceflight will be prevented by requiring official scrutiny and state control. Mandl wrote that the legislature will perhaps consider it to be its duty to make provisions in the law for the case in which a years-long spaceflight is undertaken. The spacecraft commander will have command authority and even penal power over his crew. International law will provide that during passage through non-sovereign zones occurrences on-board spacecraft are to be adjudicated according to the laws of that state to which the spacecraft belongs. The principle of "missing in space" will have to be introduced for the case wherein a spacecraft is lost and its fate unknown.

Mandl (1932), Schachter (1951), Heinrich (1953) and Horsford (1955) believed that nationality of a spacecraft probably shall be determined by the nationality of the owner or of a majority of partners.

Mandl (1932) noted that international agreements established for the internationally agreed operation of aircraft would not apply to spacecraft because of their entirely different nature. If a launch occurs on the high seas, the clearance procedures will become simplified, without, however, becoming unnecessary. Similar to the case of the launch site, the prospective landing area will have to be checked out, for the spacecraft and for all parts which are released during the flight, booster rockets and the like, to the extent that these objects do not reach the Earth's surface in a harmless form, completely disintegrated.

Jenks (1956) declared that at some future time it may be necessary to have an international code to regulate space navigation, space radio communication, spacecraft flight worthiness, and flight crew qualifications, space rescue, the carriage of passengers and goods, and law applicable to legal transactions in space. Jenks believed there would eventually be a need to agree on law to regulate:

- jurisdictional issues and questions of applicable law,
- personal legal status of individuals in space,
- rights of property beyond the Earth,

- contract law relating to contracts made in space,
- tort law applicable to tortious activity in space, and
- appropriate and applicable criminal law.

Jenks (1956) also wrote that if legislative authority over human activity beyond the atmosphere of the Earth were to be regarded as vested in the United Nations General Assembly, it would be possible to evolve progressively the necessary rules on the subject through the Assembly. Jenks believed one could conceive of the United Nations governing extra-mundane settlements, directly or by some special agency created for the purpose. The ideal arrangement would appear to be that sovereignty over unoccupied territory on the Moon or on other planets or satellites should be regarded as vested exclusively in the United Nations.

#### ON THE RESCUE AND RETURN OF SPACE OBJECTS AND OF ASTRONAUTS

Mandl (1932) wrote that in the case of a landed spacecraft causing damage on the ground, normally a lien should apply to the spacecraft for the damages suffered, for payment prior to the removal of the spacecraft. Provision probably will be made by the legislature that a person entitled to damages caused by an emergency landing will not be able to prohibit removal of the spacecraft, but there will be some general salvage or rescue obligation which will permit a claim for salvage or rescue compensation as well as for damages.

Carlo Musto (1956) believed that every state has an obligation to protect and assist space crews, even to immediate release of returned crews regardless of whether or not damage has been suffered by the state landed in, provided: (1) politico-customs controls have been complied with and (2) just compensation has been paid to any injured parties suffering property or personal injury. Damages incurred should be verified by a special state commission established in every state for this purpose, including representation from a proposed International Center for Interplanetary Flight.

#### ON THE LEGAL STATUS OF OUTER SPACE AND CELESTIAL BODIES

Zarzar (1926), Mandl (1932), Clarke (1946), Schachter (1951), Meyer (1952), and Heinrich (1953) wrote that in an area beyond the airspace appurtenant to the Earth, there is a regime in which spacecraft traffic is completely free from terrestrial jurisdictions. But Cooper (1951 and 1956) and Kroell (1953) believed that only in the area beyond the reach of Earth's gravity would there be a regime in which spaceflight would be completely free from terrestrial jurisdictions.

Mandl (1932) wrote that erection of some kinds of stations in space, or artificial moons, will require appropriate international administration and regulation of such resources, including access to space stations. Meyer (1952), Heinrich (1953), and, to some extent, Kroell (1953) wrote that space stations beyond the atmosphere could not be classified as *res communes*, or common property; their legal nature would be determined by their modes of construction. They believed that space stations would come under the dominion of the country which had constructed them or subject to whose order or protection they had been constructed. Meyer (1952) and Heinrich (1953) believed that there would be no obligation to open space stations to public access, but once opened there should be no discrimination of any kind in access. Kroell (1953) thought that space stations may be freely established for the use of space travel but they should be internationalized and be open to all. Horsford (1955) believed that a space station is a concept with enormous potentiality, unfortunately for evil as well as for good, and it is to be hoped that mankind can achieve the proper regulation of the whole question of the law to regulate spaceflight.

Cooper (1951), Schachter (1952) and Jenks (1956) explicitly believed that outer space should be free for use by nations for peaceful and scientific purposes. Schachter (1951) and Danier (1952) wrote that outer space, like the high sea, is not and should not be under the sovereignty of any nation state. However, this does not mean that outer space would be in a state of lawlessness and anarchy; it would be governed by rules of international law to provide a degree of legal order while preserving the principle of its freedom. R. A. Smith (1949)

wrote that the Moon is not the property of any state; if it is untenanted, it is the common heritage of mankind. Lionel Laming (1949) and Schachter (1951) declared that all the solar system, not only the Earth, deserves to be considered as the heritage of mankind. Oscar Schachter (1951) was even more explicit, saying that the Moon and other celestial bodies could be considered as *res nullius*, free from occupation, like the then undiscovered parts of the Antarctic continent. Schachter (1951) and Meyer (1952) proposed that outer space, the Moon, and other celestial bodies should remain free for use by all; the special rules that may be required could be established under the aegis of the United Nations. Heinrich (1953) had concluded that the entire area beyond the atmosphere would have to be considered free territory both on technical grounds founded on the law of nature and for reasons of legal construction and policy.

#### SOME CONCLUDING OBSERVATIONS

There are many additional areas we could survey here to show the variety and extent of proposed concepts of space law that were recorded in the literature well in advance of the successful first orbiting of a spacecraft. The content of this paper comprises selected extracts from the concluding chapter of a book now in preparation, entitled *Concepts of Space Law Before Sputnik*, which includes the complete texts of many of the earliest writings on space law, collected, with some translated into English, with historical introductions and annotations, where appropriate. The book is expected to be published in 1998 and should be available at the next Colloquium on the Law of Outer Space.

The conclusion one can draw from this survey is that there was no failure on the part of the legal community to see or to openly discuss the legal issues given rise to by the emergence of space-flight. Perspicacious jurists in many countries had their eyes and minds open to the potentials of the future. They addressed the foreseeable problems admirably, proposing solutions to anticipated problems well before the problems actually existed. When the United Nations Committee on the Peaceful Uses of Outer Space turned its attention to the many issues addressed in the 1960s and 1970s, there was a wealth of prior work on and thinking about the problems then faced. Unfortunately there were still curtains of

language and a lack of general access to the legal literature's of the several states. Those were the conditions in the infancy of space travel. Today, the access problem is substantially alleviated and forums such as this meeting provide valuable means for the effective international interchange of ideas. We may feel we have come a long way from those humble beginnings, but in my opinion we still have a great deal to learn by studying the substantially unexploited works of the pre-Sputnik pioneers of space law.

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[All entries in this bibliography designated by a single asterisk (\*) are included in part, and those with a double asterisk (\*\*) are included in total, in English or in English translation, in the forthcoming publication by Doyle, S. E. *Space Law Concepts Before Sputnik*, Univelt, San Diego (1998).]