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# ON THE DEFINITION AND LEGAL STATUS OF SPACECRAFT

BY DR. JULIAN G. VERPLAETSE†

## I. INTRODUCTION

THE subject of this paper is limited to all artifacts, engines and vehicles operating within the scope of outer space activity. Therefore, all air-breathing and/or air-supported engines and vehicles do not form a part of our research. Consequently, we do not consider any particular forms of the type V-1 flying bomb, developed by the Germans during World War II. This was a small low-winged craft, a kind of winged torpedo, which could fly only at uniform speeds. Its drive was continuous (the combustion process was uninterrupted during the whole period of flight); therefore, it was restricted to a certain density which in turn restricted it to a certain height, since its fuel was mixed with oxygen from the airspace. Whereas by analogy, the German V-2, may show trends toward prototype spacecraft, while the V-1 flying bomb is definitely within the pilotless plane class.

Some borderline cases, difficult to assign to either class, come readily to mind. The most obvious example is the X-15. This American experimental craft is released from an airplane at high altitude. As it soars upward it brings its pilot to the upper fringes of the stratosphere and may soon be able to enter the reaches of vertical space beyond (thermosphere or ionosphere). Since it is a winged craft most jurists have called it an aircraft.<sup>1</sup> A. G. Haley sharply opposes this view, stressing that it has no air-breathing devices and depends solely for its propulsive capacity on pure rocket power; therefore, he claims that it is in fact a pure rocket.<sup>2</sup> To be sure the whole operation has a stark amphibious outlook; therefore, the right definition may depend on the criteria adopted for the concept of a rocket vehicle in general. This point will be further considered in the following ma-

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† Max Planck Institut für Völkerrecht, Heidelberg, Germany. The author is very much indebted to Professor John Cobb Cooper and Mr. Andrew G. Haley for their active support and sympathy. He would also like to extend his thanks to Professor Machowski for suggestions relating to classification of spacecraft. For kind advice on technical matters, he owes thanks to: Mr. E. Rechlin of the California Institute of Technology; Mr. G. P. Adair of Washington, D.C.; Mr. E. F. Grant of the Hughes Aircraft Company, Aerospace Group; and Doctors Pickering and Home J. Stewart, of the California Institute of Technology.

<sup>1</sup> E.g., Wolczek, *First Colloquium on the Law of Outer Space* 115 (1958); McDougal & Lipson, *Perspectives for the Law of Outer Space*, 1958 *Am. J. Int'l L.* 425; Quigg, *Open Skies and Open Space*, 1958 *Foreign Affairs* 99; Lipson & N. de B. Katzenbach, *Report to the National Aeronautics and Space Administration on the Law of Outer Space*.

<sup>2</sup> Haley, in his comment on the Report of Lipson & Katzenbach (see *supra* note 1), included in *Survey of Legal Opinion on Extraterrestrial Jurisdiction*, Third Colloquium on the Law of Outer Space 37 (1960), deems that the wings permitting temporary use for guidance are not a determining factor. However, he asserts that if the X-15 is intended solely for use in the air, then it is an airplane using rocket power. It would seem that he, in spite of his strong voiced opinion, does not exclude the existence of amphibious types. See Haley, *Rocketry and Space Exploration* 64 (1958), wherein he cites the case of the *Natter*, a half-missile, half-piloted aircraft built in 1944 by the Germans. This was a liquid propelled craft, launched vertically by four solid propellant boosters. The pilot rode forward of the short wings and the motor was located in the aft portion of the craft. Both the pilot and the motor were parachuted after action.

terial. A related problem, but in quite another context, is the air-scoop filling station for spacecraft, which might be legally ambidextrous.<sup>3</sup>

## II. GENERAL PRELIMINARY DEFINITIONS

In order to clarify concepts it is appropriate to outline the framework of the operational field of the law of outer space. That framework is composed of two elements: environment, or medium, and instruments.

Vertical space above land and waterspace of the earth is divided *grosso modo* into the airspace governed by the law of the air, and outer space for which new regulations are sought.

A spacecraft is any man-made craft capable of being used in outer space activity.<sup>4</sup> Spacecraft can be divided *grosso modo* into rocket vehicles (the term missile is sometimes used interchangeably) and their payload, of which the most usual subdivisions are manned and unmanned.<sup>5</sup> These definitions are rough and general, and used herein for a broad purpose without attempt at refinement or diversification. In particular we express no opinion as to the limit between air and outer space or between zones thereof.<sup>6</sup> Nor is any opinion expressed as to whether that part of airspace in outer space activity belongs in the scope of air law or to the law of outer space. The present view is that this subject is in conflict.<sup>7</sup> It should also be pointed out that terminology is uncertain, and terms have been used interchangeably in the past. For instance, an artificial satellite, put into orbit by a rocket is a payload of that rocket, but this payload may harbor a non-activated vehicle, which will be used as a rocket for a trip from an outer space platform to the moon.

## III. DEFINITIONS AND CLASSIFICATIONS

### A. Rocket Vehicles

There are two ways in which to approach the definition of a rocket

<sup>3</sup> On orbital air scooping vehicles see 6 *Astronautics* No. 8, 28 (Aug. 1961).

<sup>4</sup> Other definitions which have been advanced are: "Spacecraft means any craft capable of orbital movement or of flight independently of action or reaction of the air, whether or not it is carrying instruments of observation." The David Davies Memorial Institute of International Study Group on the Law of Outer Space, Art. 1, *Draft Code of Rules on the Exploration and Uses of Outer Space* (1962); "flight craft may be applied to all devices capable of flying in flight space." Cheng, *International Law and High Altitude Flights: Balloons, Rockets and Man-Made Satellites*, 1957 *Int'l & Comp. L.Q.* 487, 490, based on John Cobb Cooper's definition of flight space as air space coupled with outer space; "All craft that cannot derive support in the atmosphere from the reactions of the air." Beresford, *The Future of National Sovereignty*, Second Colloquium on the Law of Outer Space 5, 6 (1959); Rivoire, *Design for a Law of Space*, First Colloquium on the Law of Outer Space, 100, 101 (1958) would apply space law to any craft beyond a 300 km ceiling and to all satellized craft regardless of altitude; "Tout appareil capable de se déplacer par ses propres moyens aussi bien dans l'atmosphère que dans la zone extra-atmosphérique." Bornecque-Winandy, *Droit de l'Impérialisme Spatial* 43 n.33 (1962).

<sup>5</sup> "The relationship between satellite rockets and ballistic missiles is so close that the over-all construction, propulsion, launching and guidance techniques are almost identical." Haley, *Rocketry and Space Exploration* 43. *But see*, Cocca, *Derecho Interplanetario* 163. A missile is more commonly defined as a war instrument or a weapon. It is unmanned but not necessarily rocket propelled. It is commonly described as an aerial vehicle, including only four of the six types later detailed: surface-to-surface, air-to-air, air-to-surface, and surface-to-air.

<sup>6</sup> The topic of the limit between air and outer space has produced a vast amount of literature, while the topic of zones, layers or bands, has been strangely neglected.

<sup>7</sup> See, e.g., Verplaetse, *Conflicts of Air and Outer Space Law*, Third Colloquium on the Law of Outer Space 145 (1960); Meyer, *Neue Juristische Wochenschrift* 193 (1963) stating that law of outer space should be exclusive; Beresford, *The Future of National Sovereignty*, The Second Colloquium on the Law of Outer Space 5, 6 (1959) would subject rockets to national air sovereignty, being the more restrictive of the two legal regimes.

vehicle, that is either through the medium of its activity or through the nature of instrumentality. Some proposed definitions tend to join both, in that they cling to the characteristics of the instrument, but would retain under the jurisdiction of the law of the air those instruments that do not exceed a certain height or those that do not exceed a certain speed.<sup>8</sup> It is suggested that the environmental factor should not be stressed and, above all, that prefixed altitudes should be avoided. Indeed, since the question of determining a demarcation line between air and outer space is not going to be solved in the near future, any solidification of the matter might prevent agreement on the definition of rocket vehicle. Another method of arriving at a definition has been suggested, that is through the scope of its activity,<sup>9</sup> however, no delineation of that scope is given or attempted here.

We would offer the following definition: A rocket vehicle is any apparatus projected through space,<sup>10</sup> without support of medium,<sup>11</sup> by the combustion of fuel and reagents, without intake of oxygen, the latter being carried, if needed, inside its body,<sup>12</sup> and capable of taking aloft any kind of load (capsule, ship, warhead, etc.).<sup>13</sup>

No technical or legal analogy is to be found for the rocket vehicle. While some comparisons have been advanced, they are all negative. The rocket cannot be compared to a plane, which in a technical sense is completely different.<sup>14</sup> Hence, it would be adventurous to state that a rocket vehicle is anything which does not correspond to the definition of aircraft, as given by Annex A of the Paris Convention of 1919, and Annexes 6, 7 and 8 of the Chicago Convention of 1944. The difference lies in *nature* and not in *category*. Nor can it be assimilated to a shell,<sup>15</sup> or to the German V-3 rocket of wartime memory.

Rocket vehicles may be classified according to various criteria, and

<sup>8</sup> Cf. Rivoire, *op. cit. supra* note 4, who would by way of reciprocity, modify the definition of aircraft as follows: "An aircraft will be any machine capable of keeping itself aloft in airspace. Such a machine, however, will automatically cease to be considered as an aircraft when it rises above the 300 km limit or when it begins to move on a continuous orbit." For a discrimination along the lines of the speed of the escape velocity see Fonseca, *Dynamic Limitation of the Freedom of Space*, Second Colloquium on the Law of Outer Space 24, 25-26 (1959); see also 1962 Z.L.R. 274, where Dr. Rinck proposes exclusion from the definition all small rockets such as postal rockets. *But see*, p. 280 n.5 of the Editor's annotation stating that such distinction would be irrelevant as to the question of liability; Haley, *Space Exploration-The Problems of Today, Tomorrow and in the Future*, The Second Colloquium on the Law of Outer Space 2, 52 (1959) wherein is described routes of postal rockets, some of which will reach an altitude of 1,000 miles or more. It is obvious that such rockets cannot be excluded from the law of outer space.

<sup>9</sup> Chaumont, *Le Droit de l'Espace* 65 (1960).

<sup>10</sup> On the obvious differences between a rocket vehicle and a rocket motor see Haley, *op. cit. supra* note 5, at 33 wherein he cites the Committee on Astronautics and Space Exploration of the House of Representatives.

<sup>11</sup> The fins of the X-15 and of the Dyna Soar X-20 would seem to serve the purpose of guidance and not for support. Some other types of space craft will also be equipped with small wings.

<sup>12</sup> This is a very distinctive characteristic of the rocket motor and vehicle. The rocket engine is a jet engine, but it does not, as turbojets, ramjets or pulsejets, use the oxygen of the airspace; it carries its own oxygen needed for combustion.

<sup>13</sup> Rockets without payload would have to be classified as rocket motors, not as rocket vehicles.

<sup>14</sup> See Haley, *op. cit. supra* note 5, at 167; Aircraft is defined in Annex 7 of the Chicago Convention as "any machine that can derive support in the atmosphere from the reactions of the air."

<sup>15</sup> See Spaight, *Air Power and War Rights* 214; *But see* Haley, *op. cit. supra* note 5, at 36 wherein the differences are pointed out, that it constantly gains speed and its mass decreases during every second of operation.

these classifications will have an impact on the status of the vehicle. The classifications are as follows:

1. according to fuel:<sup>16</sup>
  - a. liquid (monopropellants, bipropellants),
  - b. solid,
  - c. electrical,
  - d. nuclear,
  - e. solar radiation;
2. according to composition:
  - a. simple,
  - b. multistage;
3. according to ballistics or guidance:<sup>17</sup>
  - a. non-guided, with vertical or curved trajectory,
  - b. guided on whole or part of the trajectory, either by self-contained navigation system or from the earth;
4. according to destination:<sup>18</sup>
  - a. earth to earth,
  - b. earth to outer space,
  - c. outer space to earth,
  - d. outer space to outer space (from space platform or return),
  - e. air to outer space (from a balloon or plane),
  - f. outer space to air (retrieval by helicopter);
5. according to purpose:<sup>19</sup>
  - a. peaceful,
  - b. warlike uses;
6. according to ownership:
  - a. public (State, military, customs, police, international organizations),
  - b. private.

The latter classification finds a close analogy in the law of the air, and also in maritime law. Indeed, Articles 30 and 31 of the Paris Convention of 1919 and Article 3(a) and (b) of the Chicago Convention of 1944, contain that classical distinction. The Chicago Convention, which is only applicable to private aircraft, establishes the dichotomy of State aircraft and private civil aircraft. The distinction is important because of immunity. It should be added, however, that the Chicago Convention, unlike its predecessor, the Paris Convention, does not provide immunity for any type of State aircraft. Whether in matters of aircraft, immunity has

<sup>16</sup> See Haley, *op. cit. supra* note 5, at 35, 265. The trend is to replace chemical fuel by electricity, nuclear energy and solar radiation; see Finger, *Managing the Nuclear-Rocket Program*, 7 *Astronautics* No. 12, 18 (1962); Johnson, *Nuclear-Rocket Applications*, *Id.* at 22; Bussard, *Nuclear-Rocketry-The First Bright Hopes*, *Id.* at 32. On electric spacecraft see 7 *Astronautics* No. 6 (1962); 6 *Astronautics* No. 1, 30 (1961). On the projects of solar power see Gold, *Solar Power in Space*, 6 *Astronautics* No. 2, 34 (1961).

<sup>17</sup> This is a problem of paramount importance and it was recognized as such during experiments in World War II. See Feuchter, *Geschichte des Luftkrieges* 384, 411; on the subject generally see Hobbs, *Basics of Missile Guidance and Space Techniques*. London, N.Y. 1959. 2 Vols.

<sup>18</sup> Javitch, *Some Rules Regulating Earth to Earth, Space to Earth and Earth to Space Missiles and Interplanetary Vehicles*, Second Colloquium on the Law of Outer Space 61 (1959). The author seems to consider as an important characteristic of the spacecraft its high velocity. Any velocity higher than 4000 mph would make any transport engine from earth to earth a spacecraft.

<sup>19</sup> This point is also of importance. At present the Russians classify reconnaissance satellites as warlike, or at least as peace time espionage, while the Americans classify them as peaceful instruments.

become a customary rule of international law is at least doubtful.<sup>20</sup> Since nearly all spacecraft, up to now, have been State-owned or State-controlled, an elucidation of this point will be further attempted.

Next to classification, the time element may have an impact on status. There are currently three phases: boost or launching phase; air and outer space flight, up and downward; and eventually, re-entry phase. From the timing viewpoint it is clearly apparent that no rigid separation of air and outer space activity exists. Air enters unavoidably into outer space activity at the boosting phase as a passage zone in the course of flight (with the corresponding problem of innocent passage)<sup>21</sup> and at the moment of re-entry—*e.g.*, the descent of the capsule by parachute.

In the future there will be a need to look for different definitions of different types with their time incidents. However, it would be premature to drive particularism that far. Progress is so vertiginous that each launching indicates the need for changes and improvements,<sup>22</sup> therefore, it is advisable to keep within general headlines. One of the points, however, that must be taken into account, in the future, is the concept of destination; sky-bound and earth-bound vehicles may be governed by different principles concerning matters of liability and retrieval.

### B. Payloads

Payloads may be manned or unmanned<sup>23</sup> and both categories may be subdivided into a variety of uses: communications, meteorology, intelligence, photography, scientific, military, etc. Payloads may be further subdivided on an ownership basis into: national-international, State-private, etc.<sup>24</sup> It should also be noted that when the payload is composed of a charge of explosives it is called a warhead.

<sup>20</sup> See Verplaetse, *International Law in Vertical Space* 77 (1960).

<sup>21</sup> Art. 4-1 of the *Draft Code* of the David Davies Memorial Institute provides:

No spacecraft launched from the territory of any State may at any stage of its flight enter the airspace of another State without the consent of that State; provided that a. such consent shall not be withheld if prior notice has been given to that State of the intended flight, and it has been shown to its satisfaction that the flight is solely for scientific and peaceful purposes . . .

Professor D Goedhuis in his Report to the International Law Association at Brussels (1962) contends that the United Nations Resolution of December 20, 1961, proclaiming that outer space and celestial bodies are free for exploration and use by all States, implies the right of innocent passage through airspace for those purposes. See also his Report to the Netherlands Society of International Law (Dec. 1962). See also Becker, *US Foreign Policy for Outer Space*, 1959 JAG J. 4, 29: "so long as they are not equipped to inflict injury or damage, they do not infringe the right of the States." This position is stated with respect to outer space, however it must have an impact on the passage of spacecraft through the airspace.

<sup>22</sup> Cf. Haley, *op. cit. supra* note 5, at 167: "As the science itself is new and constantly changing, so is the industry that supports it."

<sup>23</sup> This distinction is made by: Machowski, Dainer, Saporta, Levitt, Cheng and Regala. See Machowski, *The Legal Status of Unmanned Space Vehicles*, The Second Colloquium on the Law of Outer Space 11, 113 (1959). This distinction, which is similar to that of piloted and pilotless aircraft under Art. 8 of the Chicago Convention of 1944, is rejected by Kovalev and Tcheprov (Na Pyti Kosmitcheskomy Pravy 82 (1962)) on the basis that it follows too closely the analogy of the law of the air and that both types provide equal sources of danger. This controversy, however, does not deal with the whole problem, as *manned* may mean not only the crew but the passengers as well. In the future distinctions will be necessary, although manned-unmanned may be insufficient.

<sup>24</sup> The first case of a private satellite was the Tellstar communications satellite. See Zhukov, *Problems of Space Law at the Present Stage*, Fifth Colloquium on the Law of Outer Space 25 (1962) wherein the author has correctly stressed the importance of its impact on matters of law and cooperation in outer space.

### 1. *Circumterrestrial Spaceflight*

Zadorozhnii has shown that movement in exoatmospheric space is not the only, and perhaps not the main characteristic of the artificial satellite. The main difference with air activity is that the earth turns inside the orbits of the satellite and that attraction of the earth is reduced to a dwindling effect. The earth escapes constantly under the orbiting vehicle.<sup>25</sup> For a definition we would suggest the following: an artificial satellite of the earth is a man-made celestial body circling the earth at a rim of attraction by means of the kinetic energy combined with the gravitation of our planet without essential propulsion of its own.

No technical or legal analogy is available in our quest for rules on the artificial satellite; however, some comparisons have been advanced. The satellite vehicle has been compared to: a balloon, a rocket, an island, a ship, a plane, a meteorite, and a bottle in the sea. It is submitted that none of these comparisons have an exclusive value; however, each may, in turn and for some purposes, be helpful in certain situations. At the present time, some combination of these comparisons based on the different types of satellites would offer the best approach to the problem. It stands to reason, for instance, that if the orbiting satellite is shaped in the form of a space station or a space platform, it would look more like an island, while a small experimental satellite, doomed to disintegration after a few orbits, comes closer to the bottle in the sea comparison, or juridically, to the *res derelicta*.

### 2. *Cislunar Spaceflight*

A moonprobe is any payload intended and built to explore the moon, either by way of orbit, fly-by or hard landing thereon. The latter is sometime called a moon messenger.

A moonship is a man-made space craft intended and built to make a soft landing on the moon. There are various types of moonships envisioned at present. For example, some see a moonship intended to depart from the earth, make a soft landing on the moon, then eventually return to earth, while others see a moonship built on a space station, intended to depart therefrom, make a soft landing on the moon, then eventually return to its launch station.

These types are fundamentally different, particularly in regards to the launching phase, as launching from a space station or platform requires much less power. Dr. Wernher Von Braun, who is the protagonist of space platforms, calls any ship departing therefrom a long distance spaceship.

### 3. *Interplanetary Spaceflight*

A spaceship is any man-made contrivance intended and built to operate beyond the earth's attraction, without essential propulsion of its own. In the distant future it might become convenient or necessary to distinguish the Mars-ship, the Venus-ship, etc., from other spaceships.

The problems that arise in this area are very similar to those relating to rocket vehicles. However, with spaceships the question of return to earth should be dealt with in three phases: departure from outer space, re-

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<sup>25</sup> See Zadorozhnii, *Osnovnii Problemi Nauki Kosmitcheskevo Prava*, Kosmos i Mezdunarodnoe 60 (1962).

entry—with or without stopping, and landing—which includes the aspect of retrieval.

Any further cosmic activity can be left for future generations. Intragalactic spaceflight to the other stars of *our* Galaxy, or intergalactic spaceflight to *other* Galaxies, would have to use ion or plasma rockets or electro-magnetic propulsion.

#### IV. LEGAL STATUS

No one would dream of granting a status to such unimportant vehicles as motor-cars or to such short-lived objects as shells or rounds hurled through space. But a territory, person, ship, or plane is the seat of a bundle of rights and duties which makes the conferring of a status on that object natural and imperative. In matters of spacecraft, the policies and liabilities involved are so considerable that the legal regulation has to be built around the nucleus of the permanent character or status.

A status implies a double-headed constitution. On the one hand the *status passivus*, which means that the spacecraft will have to abide by the regulations of the authority conferring the status. On the other hand is the *status activus*, which means that the spacecraft is entitled to the protection of the authority conferring the status.

Questions pertaining to the bundle of rights and duties include: incidents of ownership, liability for damage, right of retrieval, etc.<sup>26</sup> All these questions are dealt with in other chapters of the law, but those chapters presuppose the settling of the matter of status upon which rights and duties might be predicated. Some of these questions can be touched upon here by way of example. If the spacecraft is State-owned and State-controlled—this includes almost all craft launched to date—the question of immunity will play a major role.<sup>27</sup> On the question of liability, it must be determined upon what basis, fault or risk or a combination of both, liability is to be placed. Security for damages will certainly be more than in the law of the air, which is at present a thorny item. Insurance will also require determination, as to what kind of insurance, if any, could or should cover liability. It must also be determined if international cooperation in that area is necessary and whether or not such cooperation would be feasible. The problem of jurisdiction, both substantive and ad-

<sup>26</sup> More detailed problems would include: the right of destruction, in order to avoid space being cluttered with derelicts, see Jenks; *The International Control of Outer Space*, Third Colloquium on the Law of Outer Space 3, 9 (1960); Are space vehicles property of the country of origin even if they land in a foreign State? Are they to be considered as *res derelicta*, as meteorites, etc.? See Machowski, *op. cit. supra* note 23, at 111. According to our view this question can be answered in one single solution; see Verplaetse, *op. cit. supra* note 20, at 339; the diversion or capture of artificial satellites. According to scientific advice this is not possible at the present time; however, some of the information received indicates that it may be possible in the future.

<sup>27</sup> See Verplaetse, *op. cit. supra* note 20, at 158, 160. It would not seem proper to grant any measure of immunity to rocket vehicles and moon probes. Artificial satellites, moonships and spaceships might be granted a certain functional immunity. However, as far as it can be forseen at the present time, it would not be advisable to extend that immunity to the function of liability. On the latter point see 1962 Z.L.R. 270. See also Schicks, *Who Rules the Skies: Some Political and Legal Problems of the Space Age*, Institute of International Studies, 1961, where the author pleads for: "a liberalization of the prevailing rules of international law with regard to military and other public aircraft . . . if these rules are to be applied to space vehicles." Poulantzas purposes internationalization and demilitarization of all artificial satellites by suggesting analogy with public or State ships. However, such position is not free from contradiction, see *The Legal Status of Satellites*, 14 Rev. Héliénique de Droit Int'l 225 (1961).

jective, must also be solved in the future. The law applicable, both outward and inward, to spacecraft will bear to a variegated extent the imprint of status. Concerning venue, if the craft is State-owned and State-controlled, no action can be brought in courts of other States and, generally speaking, an action can not even be brought in the State's own courts. For the solution of this problem it has been suggested that an international court be set up as the proper forum to entertain such actions. However, past experiences would offer little hope that the various States would agree to such a solution.

Having thus determined the requirement of status and its related problems, the question arises as to who will confer the status or to whom will the status be connected. There are two ways of connecting the status: with the authority clinging to the engine, or with the authority clinging to the launching site. In both cases authority may be either national or international. In the past all authority concerning spacecraft has been national, but nothing would prevent the use of engines belonging to an international organization or authority, as well as the possible creation of international launching sites.

Should authority be connected with the launching site, various situations would have to be considered, such as the location of the launch site, whether it was on land, on the High Seas (Sea Dragon concept), in the air (balloon, plane) or in outer space (space platform).

The simplest approach to the problem is to connect all spacecraft, whether rocket vehicle or payload, with the authority to which they belong, that is if they belong to a national State they would have the status of that State. Should they belong to a citizen of that State, it would still be a matter of that State's authority to confer the status. If the spacecraft belongs to an international organization or authority, it would be international and subject to such authority.

Rockets and payloads, at present, have to fly the colors and carry the identification marks of the initiating authority.<sup>28</sup> However they should be registered with an international administrative body, and it would be most desirable for such a system to be agreed upon.<sup>29</sup> It must be pointed out that international registration of aircraft is not authorized under the Chicago Convention.<sup>30</sup> Therefore, international registration of spacecraft is not at present a reasonable expectation.<sup>31</sup> In the past, States have acted

<sup>28</sup> See Valladao, *Direito Interplanetario e Direito inter Gentes Planetarias*, 15 *Revista juridica da Faculdade Nacional de Direito da Universidade do Brasil* 25 (1957) calling for the use of a double emblem, that of Earth and of its Nationality. On the question of importance and conditions of nationality in matters of spacecraft see Chaumont, *op. cit. supra* note 9, at 69.

<sup>29</sup> Cf. the regulation of the topic by the *Draft Code* of the David Davies Memorial Institute, wherein Art. 5.1 provides: "Every spacecraft shall be registered . . . with the United Nations Committee on the Peaceful Uses of Outer Space." Art. 5.3 provides: "For all purposes including that of any claim concerning the activities of a spacecraft: a. every spacecraft . . . shall be deemed to have the nationality . . . of the State responsible for its launching and b. through out its life shall, with its component parts, so long as they are identifiable, be deemed . . . the property of the State concerned . . ." Art. 5.4 provides: "No spacecraft shall be operated by private persons or corporations save by licence granted by the State of which they are nationals. Any such licence shall include the provisions of Section 3, 6, 7 and this section as part of its terms." It is submitted that the terms of these provisions are clearly too general.

<sup>30</sup> Art. 77; see *Report of the Panel of Experts Appointed by the ICAO Council*, 27 *J. Air L. & Com.* 290 (1960).

<sup>31</sup> Jenks, *International Law and Activities in Space*, 1956 *Int'l & Comp. L.Q.* 99, would require consent of the United Nations; McDougal & Lipson, *Perspectives for a Law of Outer Space*, 1958 *Am. J. Int'l L.* 430, would require inspection or control by an international organization. These suggestions are not practical at present.

in jealous independence and secrecy and under the present circumstances, information of launchings to the United Nations, was the best that could be achieved.

This approach, however simple it might seem, does not cope with the entire situation.<sup>32</sup> Furthermore, even if we accept the simple connection with the proper authority as a basis, the interference of a connection with the launch site is not altogether excluded. This is all the more true since, according to scientific advice, human judgment is definitely a factor in guidance.

In some cases the law of the State will have to be taken into consideration. The law of the launch site is definitely not an outsider since rockets and ballistic missiles are integral with their launching site.<sup>33</sup> This is one of the major distinctions between the rocket and ships and aircraft. One type of rocket is bound to one type of launcher. The huge array of launching is really part of the launched body, making it dependent upon its site.

For instance, the activities, concerning launchings, of the European Space Organization (ESO) and the European Launcher Development Organization (ELDO) will be conducted, beginning in 1965, by launching European spacecraft from the Woomera Range in Australia. The impact of the launching site on status or on the incidents of status is obvious. However, the situation will depend to a great extent upon whether Australia cooperates with the European Organizations, or whether a mere use of the Australian facilities is contemplated. Generally in such cases, an international agreement would provide for a certain amount of regulation.

The concurrent importance of instrument and launching site is further complicated by the conflict between the law of the air and the law of outer space. While a spacecraft is crossing the airspace should it be considered a pilotless aircraft for which, according to Article 8 of the Chicago Convention, a special authorization, for each flight, of the State overflown is necessary? The answer should be in the negative, as the general analogy of spacecraft and aircraft must be rejected.<sup>34</sup> In any event, Article 8 does not apply over the High Seas nor over *terra nullius*.

No conflict with the Chicago Convention is possible so long as spacecraft are designated State-craft. Theoretically, it might be questioned whether State aircraft, as defined in Article 3(c) of the Chicago Convention, have to be qualified as aircraft in general, that is, in conformity with the Annexes, or whether, under these circumstances Article 3(c) also includes other flight instrumentalities. However, it is submitted that in either case the Chicago Convention is out of the picture. In reference to the Annexes, spacecraft are excluded. In the second situation, State spacecraft are excluded from the Convention pursuant to Article 3(c).

In conclusion, artificial satellites and spaceships will require different legal treatment. Combined launchings from the earth and from outer

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<sup>32</sup> E.g., the distinction made by Danier between satellites that would pass over the territory of all States, and those gravitating at a radial speed synchronized with the Earth's rotation, thus keeping their position above the same geographical compound.

<sup>33</sup> Technical advice on this point is rather confusing; however, it would seem that, except for inertial systems, the launching arrays are very particularized.

<sup>34</sup> Woetzel, *Die Internationale Kontrolle der höheren Luftschichten und des Weltraums*, 1955 Diss. Bonn 65 without argument, deems Art. 8 of the Chicago Convention applicable.

space are a prelude to great enterprises. Conflicts with intersidereal conditions and bodies of law may appear. It is at this point that the general terms and concepts of the law of outer space will split into different fields of the law. That, however, is music for the future.