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# NATIONAL SOVEREIGNTY AT HIGH ALTITUDES

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THE ATMOSPHERE surrounding the earth is generally considered to be composed of four layers, each having its own peculiar characteristics. The bottommost layer is called the troposphere, the layer of dense air in which we live, and is roughly ten miles thick at the equator and five miles thick at the poles. Next comes the stratosphere, which rises upward from the top of the troposphere to a height of about fifty miles above the Earth. Above the stratosphere is the third layer, the ionosphere, which extends outward several hundred miles to the fourth and topmost atmospheric layer. This, the exosphere, is the layer in which the atmosphere gradually merges into interplanetary space; it may extend as far as 18,000 miles out beyond the Earth.

Commercial flight today is carried on almost entirely in the troposphere and the highest known flights by airplanes of any kind have not gone beyond the lower regions of the stratosphere, being less than twenty miles above the Earth. However, in the last few years such strides have been made in research that man-made rockets and satellites have been thrust well into the exosphere, and plans are confidently being made to project human beings to such altitudes. This development has, not unnaturally, required rethinking concerning many of what were formerly the basic scientific postulates of aerial navigation, with the result that some of those postulates have been severely modified or even discarded (as, for example, the premise that the presence of air was necessary for flight).

In parallel fashion, it is considered that the recent radical development of the technique of flight, with the attendant vast increase in the area in which flight is believed to be feasible, requires a reanalysis of the basic legal rules which have evolved during the last half century to govern flight above the Earth. The most basic international legal principle in this field, underlying the documents governing international aviation (notably the Paris Convention of 1919,<sup>1</sup> which formerly reigned supreme, and the Chicago Convention of 1944,<sup>2</sup> which forms the present central law on the subject), is that each nation is sovereign over and exercises exclusive control in the airspace above its territory. This paper will be devoted to a re-examination of that concept in the light of the anticipated advances in flight technology, the intent being to determine whether or not the national sovereignty doctrine as outlined above should be considered to be properly applicable to altitudes above those now in commercial use.

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<sup>1</sup> Convention for the Regulation of Aerial Navigation, 11 League of Nations Treaty Series 173 (1922); 17 A.J.I.L. (Supp.) 195 (1923).

<sup>2</sup> Convention on International Civil Aviation, 61 Stat., pt. 2, 1180, T.I.A.S. 1591.

It is considered that in the presentation of the material which follows, logical development requires, first, a statement of what the present basic rules governing flight are, together with an exposition of the practical necessities underlying those rules. Next must follow a marshalling of the significant facts making a re-examination of the existing rules desirable or necessary. Then, if those facts indicate that revision of present concepts may be advisable with respect to the areas of space not now governed by them, the arguments in favor of alternative theories must be developed. And finally, conclusions must be reached as to what is considered to be the proper rule of sovereignty to be applied at high altitudes.

### I. THE LAW TODAY

The accepted international law governing flight above the Earth up to an altitude to be discussed shortly is clearcut. Each nation of the world is sovereign over the airspace above its territory and territorial waters, and, except as it limits itself by international agreement, it may permit or prohibit flight in that airspace at its discretion. Airspace over the high seas beyond national territorial waters is free to all and is incapable of appropriation by any nation. In order to ascertain the boundaries of a nation's airspace, a roughly conical projection may be drawn from the center of the Earth through the nation's boundaries on the surface of the Earth and on into the sky. Thus at a high altitude the national airspace boundaries will be larger than the national boundaries on the surface of the Earth.

The law as stated above is not old. Nor has it always been firmly entrenched. A short history of the development of the law will be useful in illustrating the reasons why national sovereignty over superjacent airspace is the rule today. Also, it may help to clarify whether or not today's rule will be extended to form tomorrow's law of high altitude flight.

In the early years of the present century, shortly before and immediately after the advent of the aeroplane, scholarly controversy raged over whether the earthly sovereignty of nations extended to the heavens or whether the airspace was and must remain free, *res communis*, or whether some intermediate concept was more appropriate. Fauchille was the great exponent of freedom of the air, although he admitted State sovereignty for purposes of security up to a low altitude (eventually 330 meters).<sup>3</sup> The strongest opposition to this theory came from Westlake, who advocated national sovereignty over the superjacent airspace up to the heavens.<sup>4</sup> Many writers joined the battle on each side.<sup>5</sup>

<sup>3</sup> "Le Domaine Aerien et le Regime Juridique des Aerostats," 8 *Revue Generale de Droit International Public* 414 (1901); *Traite de Droit International Public* (8th ed. of Bonfils' *Manuel de Droit International*), vol. 1, pt. II, 581, 586 (1925).

<sup>4</sup> 21 *Annuaire de l'Institut de Droit International* [hereinafter *Annuaire*] 297-299 (1906) (quoted in Hazeltine, *The Law of the Air* 15, 34-36 (1911)); see Cooper, "High Altitude Flight and National Sovereignty," 4 *International Law Quarterly* 411, 412 (1951).

<sup>5</sup> To name a few, Fauchille was followed by Nys, Meili, Oppenheim, and Ferber; Westlake by von Bar, Meurer, Wilson, and notably, Lycklama a Nijeholt.

In 1906 the Institut de Droit International adopted a draft law of the air, written by Fauchille and incorporating his views.<sup>6</sup> In 1910 an International Conference on Air Navigation met in Paris to settle the question. It accomplished little of lasting importance, although its working papers were extensively referred to in the next international conference on the subject. Agreement between the Fauchille and Westlake schools was at least reached in one respect: all considered that a plane of one nation *had the right* to fly into another nation so long as the security of the latter State and its inhabitants was not endangered thereby.<sup>7</sup>

In 1919, following World War I, a subcommittee of the Aeronautical Commission of the Peace Conference met to consider the question of the law of the air. It drafted the Paris Convention of 1919,<sup>8</sup> widely ratified (but not by the United States), which proclaimed in Article 1 thereof that every nation had exclusive sovereignty of the airspace over it. No mention was made of the right of innocent passage, so generally agreed upon in 1910, the contracting parties merely agreeing to allow each other such privileges. Interesting in this respect is the analysis of Professor Goedhuis of Holland, which shows that the intent of the drafters was not to eliminate innocent passage as a right as between the contracting parties but merely as a right upon which the nations which had been vanquished could insist.<sup>9</sup>

The United States in its international relations long fought for the principle of the freedom of the air (to the extent at least of freedom of innocent passage), arguing for such a concept as late as 1928<sup>10</sup> (although in 1926 the United States enacted a law governing interstate aviation within its borders,<sup>11</sup> in which it was stated that the United States is sovereign over its superjacent airspace<sup>12</sup>). It was in the small minority, the majority being composed in large part of smaller states not so well equipped to compete for the air commerce market as the United States. During the 1930's this country and most of the others left in the "free air" camp abandoned the struggle and turned to the absolute national sovereignty theory of international air law.<sup>13</sup> Professor Goedhuis has argued cogently that this conversion was the result of a decision that if other nations would not open their territories to American air commerce by adoption of the free air concept, the same object could be attained if the United States also closed its skies,

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<sup>6</sup> 21 *Annuaire* 297, 327 (1906).

<sup>7</sup> See Goedhuis, "Civil Aviation After the War," 36 *A.J.I.L.* 596, 598-599 (1942).

<sup>8</sup> See note 1, *supra*.

<sup>9</sup> "Civil Aviation After the War," *supra*, 599-601. The thought of limiting the air rights of vanquished foes arose after World War II also (Wilberforce, "Some Recent Developments in the International Law of Aviation," 35 *Grot. Soc.* 73 (1950)).

<sup>10</sup> See Goedhuis, *supra*, 601-602, 604.

<sup>11</sup> Air Commerce Act of 1926, 44 Stat. 568, 49 U.S.C. 171, 174-177, 179-184.

<sup>12</sup> 44 Stat. 572 (1926), 49 U.S.C. 176 (1952). Within the United States, the various states have asserted sovereign rights in their superjacent airspace, a contention which has been upheld by the United States Supreme Court (*Braniff Airways v. Nebraska Bd.*, 347 U.S. 590, 74 S. Ct. 757 (1954)).

<sup>13</sup> See Goedhuis, *supra*, 603-606.

opening them only to the extent that another country would grant equal privileges to United States enterprises.<sup>14</sup> It is interesting to note that even during this period of increasing nationalism, the technical advances being made in aviation formed the basis for at least one learned plea for a return to the concepts of Fauchille.<sup>15</sup>

In 1944, the Chicago Conference, including representatives from almost all nations involved in air travel problems except the U.S.S.R., met at the invitation of the United States to chart the path of post World War II aviation. It adopted the Paris Convention tenet that every nation is sovereign over the airspace above it.<sup>16</sup> This appeared to settle the question of sovereignty definitively. A sort of modified right of innocent passage was provided for in a companion agreement which was fairly widely accepted.<sup>17</sup> This, the so-called "two freedoms," granted to airplanes of a contracting State the right (1) to fly over the territory of another contracting State without stopping and (2) to land and take off within a foreign contracting State so long as no cargo or passengers were loaded or unloaded. A "five freedoms" agreement,<sup>18</sup> granting broader, more commercially important rights has never attained wide effect, for lack of sufficient ratifiers, although it has served as the basis for some bilateral agreements. It is noteworthy that the "five freedoms" agreement was proposed by the United States.<sup>19</sup> For noncommercial flight, innocent passage was provided for in the Convention on International Civil Aviation itself.<sup>20</sup>

Examination of the conventions of the last half century and of their preparatory work discloses certain dominant strains underlying the national sovereignty concept of airspace:

With respect to civil aviation, the dominant factor has been economic. States, especially the smaller ones, have tried to strictly limit the amount of foreign air travel coming into and leaving their borders; the attempt has been to build up domestically owned airlines and to tax and control foreign ones. Larger States, which at first advocated free air travel, have changed their views as a result of coming, through experience, to believe that the best available way to expand air commerce into the smaller, more restrictive countries is to demand *quid pro quo* on a governmental level in the matter of airport and route rights. The significance of the economic aspect is made clear by the widespread adoption of the "two freedoms" rule and the general rejection of the "five freedoms" rule.<sup>21</sup>

<sup>14</sup> *Id.* at 604.

<sup>15</sup> Korovine, "La Conquete de la Stratosphere et le Droit International," 41 *Revue Generale de Droit International Public* 675 (1934).

<sup>16</sup> See note 2, *supra*. For a convenient grouping of the various Chicago Conference texts, see 39 *A.J.I.L.* (Supp.) 111 *et seq.* (1945).

<sup>17</sup> International Air Services Transit Agreement, E.A.S. 487.

<sup>18</sup> International Air Transport Agreement, E.A.S. 488.

<sup>19</sup> *Proceedings of the International Civil Aviation Conference*, vol. 1, pp. 517-518 (Dept. State pub. 2820) (1944).

<sup>20</sup> Convention on International Civil Aviation, *supra*, Art. 5.

<sup>21</sup> See Ryan, "Policy Issues in International Air Transportation," 16 *Geo. Wash. L. Rev.* 443, 450 (1948).

In military aviation, on the other hand, the dominant factor has been security. It has been generally accepted that it is not desirable to have uninvited foreign military planes flying over national territory. However, discussions of sovereignty since World War I have not concerned themselves greatly with this matter, perhaps because it has been obvious that States would not allow themselves to be so endangered. There is a question, of course, whether it is necessary to assert air sovereignty in order to prevent such action, for the principles of private law assault might well be adopted to make actionable threatening flights of that type and to justify reasonable measures taken in self-defense in those situations. The view has been expressed, furthermore, that the military security element in the justification of national air sovereignty will diminish if President Eisenhower's mutual aerial inspection plan becomes a reality.<sup>22</sup>

A third factor is derived from private law. The adjustment of private disputes and the regulation of private conduct have been functions of the territorial sovereign as long as the concept of sovereignty has existed. Disputes between individuals concerning alleged private rights above the Earth date back at least as far as the Roman Empire, and an elaborate body of law concerning invasions of private rights in airspace was in existence at that early date.<sup>23</sup> Of course, the early law of the air was concerned with such matters as trees, overhanging buildings, and the like, but the point is that there is no record of a territorial sovereign ever having refused to determine private rights in air because he did not consider his jurisdiction to extend to the airspace over his territory. If he had not undertaken to decide such matters, it is unlikely that any peaceful forum would have been available.

In modern days, the problem has not been so different as might at first appear. The territorial sovereign has, of necessity if nothing else, determined private rights in the air over his domain.<sup>24</sup> In most cases, if he had declined this function, no forum would have been available for the peaceful settlement of such disputes. Going one step farther, the sovereign has sought to prevent disputes arising by affirmatively regulating conduct in the airspace over his territory.<sup>25</sup> Certainly no other power could show a better right to take such action, at least in the absence of an appropriate international body. It is believed that this development of internal law basically affected the concept of sovereignty in the parallel development of international law.

One significant question concerning today's generally accepted view that airspace is subject to the sovereignty of subjacent nations has been left in abeyance in the above discussion. The question is whether or not the airspace sovereignty concept as developed has a built-in altitude

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<sup>22</sup> Young, "The Aerial Inspection Plan and Air Space Sovereignty," 24 *Geo. Wash. L. Rev.* 565 (1956).

<sup>23</sup> Montmorency, "The Control of Air Spaces," 3 *Grot. Soc.* 61 (1918); Cooper, "Roman Law and the Maxim 'Cujus Est Solum' in International Air Law," 1 *McGill L. J.* 23 (1952).

<sup>24</sup> E.g., *U.S. v. Causby*, 328 U.S. 256, 66 S. Ct. 1062 (1946).

<sup>25</sup> See e.g., Air Commerce Act of 1926, *supra*.

limitation. That such is the case has been argued forcefully by Professor Cooper who contends that (1) the maxim "cujus est solum ejus est usque ad coelum" (he who owns the soil owns it to the heavens) is not authority for the proposition that a nation is sovereign over all the space above it and (2) that the word "airspace" as used in international conventions of this century is limited to the region in which reactions of the gaseous air will support flight (this area extends less than forty miles above the Earth), thus limiting to that region the scope of the conventional declarations of national airspace sovereignty.<sup>26</sup> The first point is convincingly demonstrated in his article "Roman Law and the Maxim 'Cujus Est Solum' in International Air Law,"<sup>27</sup> which establishes the fact that the maxim was developed with respect to trees, overhanging buildings, etc., and was never intended to solve problems in the upper air or above. In favor of his second assertion is the fact that the Paris Convention of 1919, dealing with "aircraft" in "airspace," defined "aircraft" in the Annexes which formed a part of the Convention as comprising "all machines which can derive support in the atmosphere from reactions of the air" and that the Chicago Convention of 1944 adopted the Paris Convention statement on sovereignty.<sup>28</sup> No definition of "airspace" or "aircraft" appears in the Chicago Convention, although the continuing body created by it (International Civil Aviation Organization) has adopted in essence the Paris Convention definition of "aircraft" as one of its guide rules.<sup>29</sup> Professor Cooper's analysis is persuasive, at least insofar as it delineates the extent to which nations by treaty have committed themselves to the sovereignty concept.<sup>30</sup>

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<sup>26</sup> Cooper, "Legal Problems of Upper Space," Proceedings, American Society of International Law, 1956, 85, 88-89, wherein the present legal situation is stated to be as follows:

"(a) Both the Paris and Chicago conventions have dealt only with those flight instrumentalities which derive support in the atmosphere from reactions of the air, such as the balloon or airplane, and have not dealt with such instrumentalities as rockets, satellites, and other space craft which are designed to move through space without atmospheric support.

"(b) The Chicago Convention contains no definition of 'airspace' but it may well be argued that, as it was adapted from the Paris Convention, it deals with no areas of space other than those parts of the atmosphere where the gaseous air is sufficiently dense to support balloons and airplanes. The highest flight by an unmanned balloon up to the present time is 140,000 feet, by a manned balloon 72,395 feet, and the highest airplane flight is 90,000 feet.

"(c) Nothing in the Chicago Convention precludes the possibility of State sovereignty being extended by international agreement, or by unilateral force, above the areas in which the airplane and balloon can be used, but there is certainly no basis on which any customary international law can as yet be considered applicable to such higher areas.

"(d) Airspace over the high seas is now free for use by all."

See also Cooper, "High Altitude Flight and National Sovereignty," *supra*, 413-414.

<sup>27</sup> 1 McGill L. J. 23 (1952). See also *U.S. v. Causby*, *supra*, at 261.

<sup>28</sup> See pp. 386-387, *supra*. "Airspace" was not defined in the Paris Convention of 1919.

<sup>29</sup> Annex 7 to the International Convention on Civil Aviation, "Aircraft Nationality and Registration Marks" (ICAO) (2d ed., 1953).

<sup>30</sup> Most other recent writers on the subject have declared that existing law should be considered to be inapplicable to the upper altitudes. See, e.g., Aaronson, "Earth Satellites and the Law," 220 Law Times 115 (1955); Schachter, "Who

A contrary argument has been made, notably by Ming-Min Peng,<sup>31</sup> who contends that at least until interplanetary travel becomes a reality the sovereignty of nations over the space above them should be considered to extend to the limits of flight. His argument is that (1) nations have always considered themselves supreme in the whole area above their territory and (2) the sovereignty statements in the conventions of this century were never considered by the contracting parties to be limitative in nature, claims of sovereignty being made to the limits of space thought to be usable by man.<sup>32</sup> Peng's first proposition is probably as true as Cooper's apparently contrary one, at least if it is taken to mean that no nation has ever conceded that its airspace was subject to the supremacy of *any other* nation. However, this is not the same as saying that at no altitude may the space above a nation's borders be considered *res communis* (in the sense of being common to all and incapable of appropriation). As a matter of practical intent, the second contention also has merit, and the continued use of the term "airspace" in 1944 may well have been for lack of a better word. However, the fact that nations may have consistently claimed sovereignty to as great a height as at the time was reasonably in issue does not mean that therefore nations have asserted sovereignty to higher altitudes than were in contemplation at the time. At most it means that it may reasonably be expected that when the question of sovereignty in higher altitudes comes to be raised, similar assertions will in all probability be made.

Whatever may be said for the two views outlined above, two things are clear: the practical problem of regulating flight in upper and outer space had not arisen when the mentioned conventions were drafted, and those documents were primarily intended to solve practical problems in parts of space which were then in commercial and military use. It is submitted that the concepts of sovereignty set forth in the Chicago Convention should be applied or not applied in the upper regions on the basis of practical determinations, such as those which underlay the development of the theory for lower altitudes, rather than on the basis of a determination of the scientific scope of the term "airspace."<sup>33</sup>

## II. TESTING TODAY'S LAW FOR APPLICATION TO TOMORROW'S HIGH ALTITUDE FLIGHT

It has been stated above that three factors underlay the development of national sovereignty in the lower altitudes: commercial development, military security, and private law necessities. Solutions to problems in those areas were considered by most nations to be best resolved

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Owens the Universe?," in *Across the Space Frontier*, 118-137 (Ryan ed., 1952); Jenks, "International Law and Activities in Space," 5 *Int'l & Comp. L. Q.* 99 (1956); Haley, "Space Law—Basic Concepts," 24 *Tenn. L. Rev.* 643 (1956); McDougal, "Artificial Satellites: A Modest Proposal," 51 *A.J.I.L.* 74 (1957).

<sup>31</sup> "Le Vol a Haute Altitude et l'Article 1 de la Convention de Chicago, 1944," 12 *Revue du Barreau* 277 (1952).

<sup>32</sup> *Ibid.*

<sup>33</sup> Space may contain "air" as far away from the Earth as 18,000 miles (Engel, "Mystery of the Air we Explore," *N. Y. Times Magazine*, April 15, 1956, pp. 27, 64).

by adopting the principle of exclusive national sovereignty, coupled with provisions for certain rights of innocent passage and distress landing.

Flight as contemplated in the altitudes above those now commercially in use will have certain characteristics differing in pertinent fashion from the type of flight which has served as the basis for the development of the national sovereignty principle:

First, in all likelihood, the physical objective of a flight will be different from what is now considered normal, in that instead of proceeding from one place on the surface of the Earth to another place on the surface of the Earth, the flight will ordinarily proceed from a place on the Earth to a place away from the Earth or from a place away from the Earth to a place on the Earth (or to another place away from the Earth).

Second, at high altitudes it is considered possible to have continuous flights around the Earth without any necessity to return thereto, this to be accomplished by placing an artificial satellite in an orbit circling the Earth, thus creating a space island from which trips can be launched further into space and back to the Earth.<sup>34</sup> This has never been considered a reasonable or desirable possibility in the areas of space now commercially used, nor is it so considered now.

Third, much, if not most, of the experimentation which must initiate the invasion of the upper altitudes is of necessity conducted through unmanned flight instrumentalities (rockets, missiles, satellites, etc.). This was not the history of the development of present-day aviation.

Fourth, almost all of the planned experimentation and development concerning flight in remote regions is to be performed by national governments rather than by private enterprises.<sup>35</sup>

There are other differences, of course, but the four mentioned above are believed to be the ones most pertinent to the present discussion. To what extent do they go to the heart of the sovereignty concept so as to require its modification or discard with respect to high altitude flight?

It has been suggested that military danger may be greater to a nation on the Earth from a high than from a low altitude, because of the added range in vision.<sup>36</sup> Of course, the added vision may render the exclusion of military spacecraft from national airspace at high altitudes ineffective as a defense against military encroachments by a foreign state.

In the commercial field the difference is considerable. Flights into the upper altitudes would not ordinarily have as their object the capturing of commercial markets in foreign countries, and if they did, merely

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<sup>34</sup> Von Braun, "Challenge of Outer Space," lecture and film (1955); von Braun, "Prelude to Space Travel," in *Across the Space Frontier*, op. cit., 12-70.

<sup>35</sup> Although see Washington Post and Times Herald, 21 March 1956, containing a statement of intent by the Lockheed Aircraft Corporation to launch an artificial earth satellite in the near future.

<sup>36</sup> Von Braun, "Challenge of Outer Space," *supra*; von Braun, "Prelude to Space Travel," *supra*, 50-55.

using a high trajectory for travel from spot to spot on Earth, control at the lower altitudes (especially near air terminals) would be sufficient protection to the subjacent State. Although commercial exploitation of outlying planets, moons, etc., may well become in time a major objective of such flights, it would not appear that the policies restricting national commerce on the Earth's surface are particularly relevant with regard to the exploitation of those spatial markets. National satellite areas and national rocket flight paths based upon sovereignty cones appear not to be scientifically practicable at the present time (or perhaps ever) because of the speeds at which satellites and rockets must fly in order to break away and stay away from the Earth.<sup>87</sup>

The matter of the nation as arbiter of personal disputes and guardian of peace and safety in the land is the third vital element underlying the national air sovereignty concept. It is submitted that the exercise of such functions in respect to superjacent space presupposes the existence of certain facts. Pertinently, these are (1) that any disputants be private parties (or entities) and thus subject to the judicial and regulatory power of a national government; (2) the ability to exert actual power over either the flight instrumentality or the person or organization controlling it or both, which normally means that the craft or the owner or operator at some time during flight operations must be present on the surface of the nation wishing to exert jurisdiction. These facts have up to the present consistently underlain the exercise of sovereignty within a nation with respect to the superjacent space. The development of commercial aviation, although widely subsidized by governments, has been a private venture, carried on by persons and organizations suable as private parties in civil litigation and subject to regulation under the criminal laws of a territorial sovereign. Flight up until the present day has been almost entirely by manned aircraft guided by persons within the aircraft itself. Finally, keeping in mind the over-flight exception to sovereignty, the fact that aircraft are manned and that in order to do business within a State they have always found it necessary to land therein, has meant that the State of territorial sovereignty has always been able to exert physical control to enforce its rules. In this respect, it has been the history of commercial air development that commercial aviation organizations have established places of business within the States in which they operate, thereby giving the territorial sovereign even greater actual power over them.

Travel in the upper altitudes as presently being developed, differing from previous air travel in the four ways mentioned, seems to sap this domestically derived foundation of national air sovereignty of most of its life so far as it might be used to justify extension of the sovereignty principle to high altitudes. First, at present and for the foreseeable future, almost all flights made at those altitudes will be planned, financed, launched, and directed by national governments, so that the power which a nation exerts to adjust relations between private parties

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<sup>87</sup> As to which, see von Braun, "Prelude to Space Travel," *supra*, 20.

will have no application. Second, at least for the next few years, most of the flights will be unmanned, being directed by remote control. Third, normally the only possibility of actual control over the object, its occupants (if any), or its owner, will be through physical force over the object in flight, because landing in a foreign State will presumably not be an objective of the flight. As stated previously, nation to nation communication or commerce is not the basic objective. Exerting physical force over an object in flight is not, even at low altitudes, considered practicable as a peaceful method of control and would be especially unsatisfactory with respect to unmanned objects.

From the above analysis it appears clear that the only one of the basic reasons underlying national air sovereignty which might rationally justify national space sovereignty is that concerning military security. Perhaps that is enough. In order to make a judgment as to that, it will be necessary to determine what the factors are which favor a rule of free space and then to make a comparative evaluation of all the relevant factors on each side.

### III. THE ARGUMENTS FOR FREEDOM OF SPACE

The basic factors militating in favor of free space at the present time are as follows:

1. As presently conceived, flight into the remote regions of space cannot be accomplished without sooner or later crossing over foreign states. Considering the rotation of the Earth and the immense distance to be traveled, such crossing appears to be inevitable. Whether it is sooner or later depends primarily on the size of the nation in which the flight is launched.

2. At present it is considered that the primary hope for discovering data about interplanetary space and for launching interplanetary flights lies in the placing of man-made satellites in orbits circling the Earth. To successfully place such a satellite within a reasonable distance from the Earth, say 1000 miles, will require a speed which will result in such a satellite's circling the Earth in a matter of several hours.<sup>38</sup> In other words, the satellite will not be able to keep within any national sovereignty cone projection, and in all likelihood will pass through most such projections during its circumnavigations of the Earth.

3. A significant value of flight into high altitudes is the additional data which may be gleaned concerning the Earth, an extension of the benefit which circumnavigation of the globe by sailing ships furnished in the fifteenth and sixteenth centuries.<sup>39</sup> This value, of course, inheres in flight at low altitudes as well, but becomes of considerable new significance in the light of the plans for high-speed, nonstop, orbiting satellites at vastly increased altitudes, making it possible for the entire Earth to be viewed in a single day.

4. The hazards of high altitude flight, so far as they are known, are

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<sup>38</sup> Von Braun, "Prelude to Space Travel," *supra*, *passim*.

<sup>39</sup> See Haley, *supra*, 650.

not matters which can be reduced by control by the subjacent territorial sovereign. In low altitude flight, landing, taking off, routes over mountain ranges, weather forecasting, and similar problems are all best handled on the local level, coordinated by the underlying territorial sovereign. In high altitude flight the problems are different—the only takeoff is the original one, mountain ranges are not a problem, and weather forecasting, at least as known today, does not extend to the upper regions under consideration. The problems, so far as known, consist of things such as the general nature of the ionosphere and exosphere, methods of generating speed without excessive heat, overcoming gravity to the necessary extent, etc.—matters which can best be taken up on the drawing board and in the laboratory of the launching State and, of course, in experimentation in space itself.<sup>40</sup>

5. Scientific knowledge in the field is, at best, tentative. That experimentation is necessary is manifest. That it will be carried on with great care is obvious, both from the tremendous expense involved and from the fact that nations responsible for millions of their own subjects' lives are carrying on the work.

The general conclusion toward which the above factors militate is that the growth toward interplanetary communication and commerce should not be stunted by putting impossible restrictions upon it, even though temporary fears of a military nature may exist.<sup>41</sup> Extension of the national sovereignty principle would indeed impose impossible restrictions, since the failure of even one nation to permit flight through its cone could effectively prevent all development in the field.<sup>42</sup>

A further argument has often been used to bolster the case for free air. The proponents of freedom of space, from Fauchille through Jenks, have turned to maritime law for support, stating that the law of the sea provides the only really apt analogy for use in developing the law of space. Thus the latter has recently averred that space beyond the Earth's atmosphere is analogous to the high seas and is and must always be incapable of appropriation by the projection into it of any particular sovereignty based on a fraction of the Earth's surface.<sup>43</sup>

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<sup>40</sup> See Plumb, "Navy Computer 'Explores' Space," N. Y. Times, April 1, 1956, p. L 19; Haley, *supra*, 650-657; McDougal, *supra*, 75.

<sup>41</sup> This consideration differs from a related argument which seems to have underlain the work of several recent writers, viz., that the sphere of influence of the Earth itself is limited and that attempts to regulate too far into space must fail for that reason. See Jenks, *supra*, 104, wherein he states that the national sovereignty concept cannot be applied beyond the Earth's atmosphere, because the realities of interstellar space make such a concept "a meaningless and dangerous abstraction." Cf Cooper, "High Altitude Flight and National Sovereignty," *supra*, 417. That argument may have some philosophical appeal, it having always seemed anomalous for a tail to wag a dog, but it must be remembered that the City of Rome ruled the ancient world and that England ruled an empire many times her size. Nothing has been brought forward to show that the Earth is not in a position to extend its power throughout the universe.

<sup>42</sup> See Haley, *supra*, 652 with respect to the application of this thought to the existing U.S. satellite program. Cf Peng, *supra*, justifying the extension of the national sovereignty principle, despite all practical difficulties, because of the immense danger to subjacent States which he says otherwise must exist.

<sup>43</sup> Jenks, *supra*, 104. He goes on to cite the lack of international objection to the United States satellite launching plan as an example of the acceptance of his thesis in State practice.

It is true that certain rough similarities exist. Air, like water, does not readily yield itself to physical occupation. In fact, Grotius, in arguing for freedom of the seas, analogized the sea to the air, which he said was by nature incapable of appropriation.<sup>44</sup> The two media are generally considered to be conduits of communication and pathways to commercial markets. And in each there is an area in which there may be great potential military danger to nations. Furthermore, the history of the development of the concept of freedom of the seas bears a resemblance to what has been happening in air law, evidencing a struggle between a desire for national control, triumphant in the early years of sea traffic, and a desire for free access to unexploited markets in remote corners of the globe.<sup>45</sup>

However, it is well to remember the words of Mr. Justice Frankfurter:<sup>46</sup>

“One of the most treacherous tendencies in legal reasoning is the transfer of generalizations developed for one set of situations to seemingly analogous, yet essentially very different, situations.”

Certain of the alleged similarities, upon closer analysis, turn out to be differences. First, in sea history it was the powerful sea States (especially Spain and Portugal) which wanted closed seas and the States just developing their sea power which wanted open seas. The reverse has been true in the development of air law.<sup>47</sup>

Second, whereas the military danger from the sea decreases for a nation as the distance between a foreign warship on the sea and a seacoast increases, recent thought is that danger to a nation may actually increase as the distance between it and a flight instrumentality increases, at least up to as remote an altitude as 1000 miles.<sup>48</sup>

It may be that in time the sea analogy will become more pertinent, when the aspect of commercial exploitation beyond the Earth becomes dominant. At that time young, growing nations may argue for free space. However, at the present time commercial markets remain on the Earth where exploitation tends to be of the small nations by the larger ones, thus leading the former to desire closed skies.

Perhaps the analogy to be made is to sea law at an earlier stage, long before the Papal Bulls of 1493, when the sea was first being explored. The space above the Earth is in much the same situation now as the high seas were then, when only their fringes had been explored, the uses to which they could be put were relatively unknown, and even the means of navigating them were experimental. At this time, and prob-

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<sup>44</sup> Grotius, “The Freedom of the Seas” (1608) 28 (Carnegie Endowment, McGoffin transl., 1916).

<sup>45</sup> See Colombos, *International Law of the Sea* 40-48 (3rd rev. ed. 1954).

<sup>46</sup> *Braniff Airways v. Nebraska Bd.*, 347 U.S. 590, 603, 74 S. Ct. 757, 765 (1954) (dissenting opinion).

<sup>47</sup> See Goedhuis, “Civil Aviation After the War,” *supra*; Goedhuis, “The Air Sovereignty Concept and United States Influence on its Future Development,” 22 *Journal of Air Law and Commerce* 209 (1955).

<sup>48</sup> See p. 391, *supra*.

ably for the above reasons, the seas were considered open to all.<sup>49</sup> With only the lower fringes of the space above the Earth explored, with the uses to which the vastnesses of space can be put largely unknown, and with the means of navigating through them basically experimental, the state of man's mastery over the air appears to be very like his mastery over the sea at that early date. The same necessity for exploration and experimentation that argued for open seas at that time now argue for open skies.<sup>50</sup>

#### IV. CONCLUSIONS

Weighing the arguments for extending the principle of national sovereignty to the upper altitudes against the arguments in favor of freedom of space in such regions may be summarized as the pitting of military security against exploration and discovery. Nations will necessarily differ in the conclusions they reach, depending primarily upon the extent to which they have a direct interest in the exploration. The attitude of the primary experimenting nations concerning the military aspects of space flight may also have a practical effect on such determinations.

As stated above, flight at high altitudes cannot be carried on as presently conceived without passing through foreign national cone projections. If military security is considered the dominant factor even at such altitudes, there are only two practical alternatives: (1) bar military flight at such altitudes but permit nonmilitary flight, or (2) if that is not considered sufficient protection, bar all flight in such regions. The second alternative seems too restrictive to be tolerated. The first may be practicable, although it is open to the objection that, since as a factual matter most flights will be carried out by national governments, the barring of military flights will very likely not accomplish its purpose. In using the term "bar" above, the fact is not overlooked that the national sovereignty principle leaves open the possibility of bilateral and multilateral treaties granting flight privileges, but it is considered that the requirements of satellite flight are such that the consent of *all* nations is a prerequisite.

If exploration and discovery are considered more important than the reasonable fears of military encroachment through flight in upper space, either (1) free space or (2) free space modified to prohibit the more dangerous forms of military activity should be advocated as the basic rule for flight at high altitudes. The second alternative here may for all practical purposes be the same as the first alternative mentioned in the preceding paragraph, although one might be considered as an

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<sup>49</sup> I *Oppenheim's International Law* 582 (8th ed. by Lauterpacht, 1955).

<sup>50</sup> See, e.g., Engel, "Mystery of the Air We Explore," *supra*, who concludes by saying (at 64):

"Nothing is really known of the exosphere or of the upper half of the ionosphere or of how they may influence events far below on the surface of the Earth, like radio broadcasting and the weather. Man will not know until he gets exploratory missiles and platforms up there—perhaps with man himself aboard one day—to find out."

exception to the sovereignty principle and the other as a modification of the free space principle, with the latter lending itself more rationally to the development of an assault principle as suggested above.<sup>51</sup>

That a compromise between the two absolutes of free space and national sovereignty is necessary is implicit in Professor Cooper's most recent proposed solution to the problem.<sup>52</sup> Of course, his acceptance of today's law for the altitudes now in commercial use may be considered a compromise in itself,<sup>53</sup> but the pertinent limitation is that in the area defined by him as "contiguous space" free transit is permitted only for "non-military flight instrumentalities." Whether this rule would effectively prevent military flight above that zone it is difficult to say; if it did not, it would not appear that the danger to the nations of the Earth had been satisfactorily reduced. However, the intent is certainly evident to minimize military danger without thereby rendering impossible the desired exploration and discovery.

From the point of view of the United States, the free space principle would appear to be advantageous. This nation is in the forefront of experimentation in the field of high altitude flight, and it would be among the first to gain the fruits of exploration and discovery in upper and outer space. With regard to military danger, while the placing of restrictions on military use of the upper altitudes would not be objectionable if enforceable, complete freedom of operations in such areas would more likely work to the advantage of the United States than to its disadvantage. This is because of its forward position in research.

From the above analysis, the final conclusion to be reached appears to be that, although due to the factors outlined above, an international convention might now find more nations voting for an extension of national sovereignty than for free space, the infant state of knowledge concerning upper and outer space makes free space the more desirable basic principle, at least temporarily, for the world and, incidentally, for the United States. Limitations on the use of the upper altitudes for military purposes would appear to be unobjectionable if enforceable, as indeed might limitations on the use of lower altitudes for such purposes. For present purposes, however, it seems sufficient to conclude that above the altitudes in which the Chicago Convention of 1944 is applicable the principle of free space should reign.

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<sup>51</sup> See p. 388, *supra*.

<sup>52</sup> That solution is as follows ("Legal Problems of Upper Space," *supra*, 91):

"(a) Reaffirm Article I of the Chicago Convention, giving the subjacent state full sovereignty in the areas of atmospheric space above it, up to the height where 'aircraft' as now defined may be operated, such areas to be designated 'territorial space.'

"(b) Extend the sovereignty of the subjacent state upward to 200 miles above the earth's surface, designating this area as 'contiguous space,' and provide for a right of transit through this zone for all non-military flight instrumentalities when ascending or descending.

"(c) Accept the principle that all space above 'contiguous space' is free for the passage of all instrumentalities."

<sup>53</sup> See Goedhuis, "The Air Sovereignty Concept and United States Influence on its Future Development," *supra*.