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A journal devoted to the legal problems arising  
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## CONTENTS

### ARTICLES

- Gerald J. Mossinghoff, and Laura D. Fuqua, *United Nations Principles on Remote Sensing: Report on Developments, 1970-1980* . . . . . 103
- Vladimir Kopal, *The Question of Defining Outer Space* . . . . . 154
- Stephen Gorove, *The 1980 Session of the U.N. Committee on the Peaceful Uses of Outer Space: Highlights of Positions on Outstanding Legal Issues* . . . . . 174

### SPECIAL FEATURES

- Current Documents . . . . . 188
- Texts of Draft Principles as Contained in the Report of the Legal Sub-Committee on the Work of its Eighteenth Session . . . . . 188
- Draft Resolution on Space Law for Adoption by the Belgrade Conference of the I.L.A. (August, 1980) . . . . . 192
- Events of Interest . . . . . 194
- A. Past Events . . . . . 194
1. Space Law Session, Belgrade Conference of the International Law, Association, August 18, 1980. (D. Goedhuis) . . . . . 194
2. Symposium on "Satellites, Space and International Law", Annual Convention of the Federal Bar Association, Washington D.C., August 27, 1980. (H. Berger) . . . . . 199

3. The 28th Colloquium on the Law of Outer Space, Tokyo, Japan, September 21-28, 1980. (I.H. Ph. Diederiks-Verschoor) .....	200
4. Symposium on Space Activities and Implications, Centre for Research of Air and Space Law, McGill University, Montreal, Oct. 16-17, 1980. (J. L. Magdelénat) .....	206
5. Session of the AALS Section of Mass Communications Law on the Future of International Communications, San Antonio, Jan. 4, 1981. (S. Gorove) .....	207
6. Other Events .....	207
7. Brief News .....	208
B. Forthcoming Events .....	208
Book Reviews/Notices .....	209
Gorove, S. (ed.), <i>The Space Shuttle and the Law</i> (D. Fuqua),	209
Matte, N. M. <i>Space Policy and Programmes Today and Tomorrow; The Vanishing Duopole</i> , (N. Jasentuliyana) ....	209
Hechler, K., <i>Toward the Endless Frontier: History of the Committee on Space and Technology</i> .....	212
Grey, Jerry and Krop, Christine (eds.), <i>Space Manufacturing Facilities-3</i> .....	212
Recent Publications .....	214
Books .....	214
Articles .....	214
Book Reviews .....	216
Official Publications .....	216
Miscellaneous .....	219
Index .....	221

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UNITED NATIONS PRINCIPLES ON REMOTE SENSING:  
REPORT ON DEVELOPMENTS, 1970-1980

*Gerald J. Mossinghoff\**  
*and Laura D. Fuqua\*\**

*Introduction*

There is a growing awareness among the nations of the world that we are only beginning to appreciate fully the scope of the benefits which will flow from mankind's conquest of space. In science and technology, and in exploration and earth applications, the impressive down-to-earth results of national and international space programs assure that activities in space will soon become an integral and routine part of our daily lives.

The global benefits of our space programs are no more clearly defined than in the field of remote sensing from space. At a time when world supplies of food, water and energy are dwindling, and natural disasters and man-made hazards threaten our environment, the ability to acquire data about our planet from the vantage point of space is contributing to world efforts to manage our precious resources. For more than two decades, successive generations of remote sensing satellites have increased our ability to learn more about our planet. By equipping satellites with devices that sense the Earth's surface in different frequency ranges—including spectral bands not visible to the human eye, *e.g.*, ultraviolet and infrared—scientists obtain data that can practically be gathered in no other way.

The inherently worldwide nature of remote sensing is underscored by increasing international activity. During 1980, Landsat ground stations, owned and operated by the host countries in Argentina, Australia, Brazil, Canada, India, Italy, Japan and Sweden, will receive data from NASA's Landsat satellites and further distribute the data to national and international users. France, Japan, India and the European Space Agency are now developing their own remote sensing satellite systems; when operational, they will complement those of the U.S. and U.S.S.R.

In recognition of the critical importance of remote sensing from space, and in appreciation of the international character of such programs, the United Nations Committee on the Peaceful Uses of Outer Space ("COPUOS") has for several years undertaken a detailed consideration of legal implications of remote sensing of the Earth from space, with the goal of formulating and agreeing upon principles. It is the purpose of this paper to trace the development of those principles and, through the appendices, to publish in one place various texts of the principles that have been proposed over the years. The latest text of the principles, as documented in the report of the Legal

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\*Deputy General Counsel, National Aeronautics & Space Administration ("NASA") and a Member of the U.S. Delegation to the U.N. Committee on the Peaceful Uses of Outer Space and to its Legal Subcommittee, 1980. The views expressed herein are those of the authors and do not necessarily represent the views of NASA or the U.S. Government.

\*\*Research Assistant, Office of the General Counsel, NASA.

Subcommittee of the COPUOS on the work of its 1980 session,<sup>1</sup> is set forth in Appendix I. With respect to this and all other texts of U.N. documents quoted in the appendices, square brackets are used to set off words, phrases or clauses on which no agreement or consensus has been reached. It should also be understood that before a formal consensus is reached on any principle, it is subject to a final reading in the COPUOS; no principle has been involved in such a procedure.

*Working Group on Remote Sensing of the Earth by Satellite, 1971-1974*

The first reference to remote sensing in the United Nations General Assembly was in December of 1969, when the COPUOS was requested to study possible international cooperation in this field.<sup>2</sup> This task was assigned to the Scientific and Technical Subcommittee ("S & T Subcommittee") of the COPUOS,<sup>3</sup> and consideration of the development and use of this technology was begun at the Subcommittee's April 1970 meeting. At that meeting, the S & T Subcommittee had before it several documents which it reviewed and recommended to the parent COPUOS. These included:

Model of plans for a developing country to establish participation in an operational earth resource survey satellite system within the decade,<sup>4</sup>

Note by the Secretariat on the applicability of space and other remote sensing techniques to the management of food resources,<sup>5</sup>

Use of remote sensing in the earth-orbital space for the discovery, inventory, evaluation, development and conservation of earth's natural resources,<sup>6</sup>

Report of the Secretary-General to the Economic and Social Council on natural resources satellites.<sup>7</sup>

Based on the work of the S & T Subcommittee, the General Assembly on 16 December 1970 adopted a resolution welcoming the efforts of the COPUOS "to promote such practical applications of space technology as earth resources surveying" and requested the S & T Subcommittee to undertake efforts preparatory to the

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<sup>1</sup>U.N. Doc. A/AC. 105/271 (10 April 1980), Annex II, pp. 7-11. All citations in this paper are to the English text.

<sup>2</sup>U.N. G.A. Res. 2600 (XXIV) (16 December 1969).

<sup>3</sup>U.N. Doc. A/AC. 105/PV. 84, p. 3.

<sup>4</sup>U.N. Doc. A/AC. 105/C.1/CRP.2.

<sup>5</sup>U.N. Doc. A/AC. 105/C.1/CRP. 5.

<sup>6</sup>Report prepared by the U.N. Outer Space Affairs Division in 1967 and submitted as Background Information Paper No. 13 to the Conference on the Exploration and Peaceful Uses of Outer Space.

<sup>7</sup>U.N. Doc. E/4779.

convening of "a working group on earth resources surveying with special reference to satellites."<sup>8</sup> At its July 1971 meeting, the S & T Subcommittee decided to establish and convene a "Working Group on Remote Sensing of the Earth by Satellites,"<sup>9</sup> and the first meeting of the Working Group was held, as recommended by the Subcommittee, in connection with the September 1971 meeting of the full COPUOS. Acting on a draft resolution submitted by the twenty member states of the Working Group,<sup>10</sup> the General Assembly in December 1971 endorsed the efforts of the Working Group and called upon member states to "submit information on their national and cooperative efforts" in remote sensing, requested the Working Group to solicit the views of appropriate U.N. bodies, and requested the Secretary-General to submit comments and working papers to the Working Group.<sup>11</sup>

The next session of the Working Group was held in May 1972.<sup>12</sup> Recognizing the need for more information, it requested the Secretary-General to assess the available resources and documents and to prepare a background paper to be used by the Working Group at its next meeting. This background paper was to include a summary of the views and comments submitted in response to the 1971 General Assembly resolution. A task force was formed to assist the Secretary-General in preparing this paper, which was completed in time for the January 1973 session of the Working Group.<sup>13</sup>

At that session, the Working Group for the first time discussed at length the question of the legal implications of remote sensing of the earth by satellite.<sup>14</sup> It noted that the opinions of member states "ranged from the desirability of requesting studies on a wide array of legal subjects to suggestions that the study of scientific and technical aspects and organizational alternatives should for the time being have priority."<sup>15</sup> The Working Group further noted that the "delegation of the USSR formulated a preliminary draft of legal principles to be applied by States utilizing space technology in exploring the resources of the earth."<sup>16</sup> Those principles, which were not discussed by the Working Group, are set forth in Appendix II. Since the question of the legal

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<sup>8</sup>U.N. G.A. Res. 2733 (XXV) (16 December 1970).

<sup>9</sup>U.N. Doc. A/AC. 105/95 (19 July 1971).

<sup>10</sup>U.N. Doc. A/C. 1/L. 571 (5 November 1971).

<sup>11</sup>U.N. G.A. Res. 2778 (XXVI) (8 December 1971).

<sup>12</sup>U.N. Doc. A/AC. 105/C. 1/L. 49/Add. 1 (9 May 1972).

<sup>13</sup>U.N. Doc. A/AC. 105/C. 1/WG. 4/CRP. 7 (6 December 1972).

<sup>14</sup>U.N. Doc. A/AC. 105/111 (14 February 1973).

<sup>15</sup>*Id.*, p. 11.

<sup>16</sup>*Id.*, pp. 11 and 12.



implications of earth resources surveys was now on the agenda of the Legal Subcommittee of the COPUOS, which was to convene in March 1973, the Working Group requested the views of the Legal Subcommittee on the general topic of remote sensing, but did not reach any conclusions on specific questions to be put to the Legal Subcommittee.

*Role of the Legal Subcommittee, 1973-1980*

The Soviet draft principles were also submitted to the Legal Subcommittee at its 1973 meeting, and reprinted as an annex to its report,<sup>17</sup> but because of lack of time the Subcommittee was unable to consider the agenda item on "Matters relating to the activities carried out through remote sensing satellite surveys of earth resources."<sup>18</sup> In response to the report of the Legal Subcommittee the full COPUOS at its 1973 session specifically "requested the Legal Subcommittee thereafter to devote part of its next session to responding to the request of the Working Group . . . for its views on the legal implications of remote sensing satellites."<sup>19</sup>

In a parallel effort, the COPUOS Secretariat had undertaken, in response to the 1971 General Assembly resolution<sup>20</sup> and a request of the COPUOS, to conduct a detailed survey of potential users of remote sensing from space based on a questionnaire prepared by the S & T Subcommittee at its 1973 session. Responses were received from 28 member states, and the report of the Secretariat documented the deep and wide ranging interest in the new capability of remote sensing.<sup>21</sup> The Canadian response, in addition to addressing in detail the technical, organizational and legal aspects of remote sensing, submitted "possible options" illustrating rights and obligations during the three separate phases of remote sensing. The Canadian "options," which effectively anticipated the range of issues that were to become central to subsequent considerations of remote sensing principles, are set forth in Appendix III.

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<sup>17</sup>U.N. Doc. A/AC. 105/115 (27 April 1973), Annex III, p. 7. See also U.N. Doc. A/AC. 105/111 (14 February 1973), para. 48. Minor differences in phraseology are assumed to be the result of differences in translations.

<sup>18</sup>*Id.*, p. 14.

<sup>19</sup>U.N. Doc. A/9020 (1973), p. 5.

<sup>20</sup>*Id.*, at 11.

<sup>21</sup>U.N. Doc. A/AC. 105/C. 1/WG. 4/L. 6 and Add. 1-10 (28 November 1975). The results of an earlier survey conducted by the Secretariat are set forth in U.N. Doc. A/AC. 105/C.1/Wg. 4/CRP. 2 and Add. 1-6. A synopsis of the replies prepared by the COPUOS Secretariat appears in U.N. Doc. A/AC. 105/C. 1/WG. 4/L. 11 (21 February 1974).

The responses from several states gave impetus to the efforts then underway to address in detail the legal implications of remote sensing. As summarized by the Secretariat in its synopsis of the responses:

Eight States (*Argentina, Belgium, Brazil, Canada, France, Mexico, Norway and Sweden*) felt that there is no specific international legal regime to govern remote sensing of the earth by satellites. In their view, existing principles were of a general character as well as being inadequate. The majority of them felt that the principles presently applicable could be derived from the Outer Space Treaty or the general principles of International Law. One of them (*Canada*) felt that there is no automaticity in the application of international law to this new activity while six of them (*Argentina, Brazil, Canada, France, Mexico and Sweden*) stated that the search for new laws was necessary because though remote sensing takes place in outer space, its effects are terrestrial and affect sovereign interests of States.

With specific reference to the Outer Space Treaty, one State (*United States*) stated that it considered the principles embodied therein applicable to remote sensing; another State (*Sweden*) stated that it believed that the Treaty is not intended to cover an activity which has as its object the earth and its resources.

Among the reasons given for the need for the elaboration of principles in this field were: lack of an international regime to govern the activity or the inadequacy of existing international law to cover the area, the limited application of the Outer Space Treaty to matters directed from earth to space (*Argentina and Sweden*); the contradiction between the absolute freedom of observation of the earth from space and the spirit of the Outer Space Treaty and international law (*Mexico*); the application of the principle of scientific freedom for research activities and space exploration is limited to the activities directed from earth to space or between different celestial bodies (*Argentina*); concern of States that they might be commercially exploited, their privacy invaded, sovereignty compromised or security weakened (*Canada and Sweden*); information received from space crossed the boundaries of various States (*Greece*); need to give adequate protection to sensed States (*Norway and Singapore*).

Four States (*Belgium, Canada, Japan and Sweden*) felt that the need or the desirability of elaborating new principles in this field will depend on the arrangements reached in the organizational field for operating systems. Two of them (*Belgium and Sweden*) considered that organizational arrangements should be devised to take care of the concerns of States and such arrangements are generally more efficient than legal regulations of such activity.<sup>22</sup>

In its final report of 13 March 1974,<sup>23</sup> the original Working Group on Remote Sensing analyzed the capabilities and potential of remote sensing from technical, operational and economic viewpoints, but concluded that its report could not be exhaustive because remote sensing was "still in a dynamic state of development."<sup>24</sup> With regard to the legal implications of remote sensing, the Working Group noted that

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<sup>22</sup>Synopsis of replies, *id.*, pp. 7 and 8.

<sup>23</sup>U.N. Doc. A/AC. 105/125 (13 March 1974).

<sup>24</sup>*Id.*, p. 26.

the Legal Subcommittee had that question on its agenda, and that five delegations—USSR, Canada, Argentina, Brazil and France—had submitted documented proposals or options on the legal aspects of remote sensing. The USSR and Canadian proposals have already been mentioned.<sup>25</sup> The proposals of Argentina,<sup>26</sup> Brazil,<sup>27</sup> and France<sup>28</sup> are reproduced in Appendices IV, V and VI, respectively. A joint proposal of France and USSR,<sup>29</sup> also submitted to the Legal Subcommittee, is set forth in Appendix VII.

From this point forward, successive General Assembly resolutions have reinforced the predominate role of the Legal Subcommittee in the drafting of and exchange of views on remote sensing principles.<sup>30</sup> Since 1975, the Legal Subcommittee has included "Legal implications of remote sensing of the earth from space" as a priority item on its agenda; and since 1976, the formulation of draft principles has been a specific goal of the Subcommittee's work.

At its 1975 session, the Legal Subcommittee allocated one week to the agenda item on remote sensing, and established a new Working Group of the Subcommittee (hereinafter referred to as "WG"), open to all members of the Subcommittee. A joint proposal of Argentina and Brazil,<sup>31</sup> co-sponsored by Chile, Mexico and Venezuela, on basic draft articles for a treaty on remote sensing, replaced the earlier separate proposals of Argentina (Appendix IV) and Brazil (Appendix V). The draft treaty proposed jointly by Argentina and Brazil is reproduced in Appendix VIII. A working paper by the United States on the development of additional guidelines on remote sensing of the natural environment of the earth from outer space<sup>32</sup> was submitted to the Subcommittee and considered by the WG. The U.S. working paper appears in Appendix IX.

Pending the actual drafting of legal principles on remote sensing, the WG focused on what had become the three major proposals: those submitted by (1) France/USSR, (2) Argentina/Brazil and (3) United States. The WG noted that "there were certain

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<sup>25</sup>See text accompanying footnotes 17 and 21.

<sup>26</sup>U.N. Doc. A/AC. 105/133 (6 June 1974), Annex IV, pp. 1-3.

<sup>27</sup>*Id.*, at 3-5.

<sup>28</sup>*Id.*, at 5 and 6.

<sup>29</sup>*Id.*, at 9 and 10.

<sup>30</sup>U.N. G.A. Res. 3182 (XXVIII) (8 December 1973); U.N. G.A. Res. 3234 (XXIX) (12 November 1974); U.N. G.A. Res. 3388 (XXX) (18 November 1975); U.N. G.A. Res. 31/8 (8 November 1976); U.N. G.A. Res. 32/196 (20 December 1977); U.N. G.A. Res. 33/16 (17 November 1978); and U.N. G.A. Res. 34/66 (5 December 1979).

<sup>31</sup>U.N. Doc. A/C. 1/1047 (October 1974).

<sup>32</sup>U.N. Doc. A/AC. 105/C. 2/L. 103 (February 1975); Press Release USUN 10 (75) (19 February 1975).

common elements to be found in the three drafts and the views expressed by many members in several areas," which it identified as follows:

- (a) that remote sensing activities by means of space technology should be conducted for the benefit and in the interest of all mankind; this new technology would be of particular significance to developing countries in their plans and programmes for national development;
- (b) that remote sensing activities by means of space technology should be conducted in accordance with international law including the United Nations Charter and the 1967 Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and other Celestial Bodies;
- (c) that the maximum benefits to all countries could be obtained by international co-operation at all levels, particularly on a regional basis;
- (d) that States undertaking programmes for remote sensing activities by means of space technology should encourage international participation
- (e) that in remote sensing activities by means of space technology measures should be taken to promote efforts for the protection of the natural environment of the earth.<sup>33</sup>

In addition to these areas of agreement, the WG identified the following as being "among the main questions raised and considered" by the WG:

whether a future international instrument on remote sensing should deal with remote sensing of the natural resources of the earth or with the whole natural environment of the earth; whether sovereign rights of States over their natural resources apply also to information on those resources; whether consent of the sensed State should be required and, if so, whether the consent should be applied to all or only certain remote sensing activities; whether the question of consent should not be considered within the broader context of international co-operation and participation; whether a distinction should be made between the question of access to information on resources within national jurisdiction and on resources outside national jurisdiction; whether the access by the sensed States, the sensing State and third parties respectively to information or data should be unlimited or subject to certain conditions and, in the event of the latter, whether it might be possible to draw on analogies with the existing domestic practice of some States whereby they protect the confidentiality of certain kinds of information concerning their natural resources, and formulate similar guidelines in regard to data collected by means of remote sensing on an international level; whether there should be parallel consideration of the legal and organizational aspects of remote sensing; whether certain organizational and technical solutions might not help resolve some legal problems.<sup>34</sup>

During the 1976 meeting of the Legal Subcommittee, the WG formulated five draft principles based primarily on the five common elements it had identified the previous year, together with a sixth common element that:

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<sup>33</sup>U.N. Doc. A/AC. 105/147 (11 March 1975), Annex III, p. 2.

<sup>34</sup>*Id.*, at 2 and 3.

States participating in remote sensing programs should make available technical assistance in that area to other interested States on mutually agreed terms.<sup>35</sup>

The five draft principles formulated by the WG in 1976 are reproduced in Appendix X. In addition to the draft principles, the WG identified the following three new common elements:

- (a) The United Nations and other relevant international organizations could play a useful role in the area of remote sensing, especially as far as co-ordination of activities and co-operation between States, including technical assistance, are concerned.
- (b) States participating in remote sensing which obtained information indicating an impending natural disaster should make this available as soon as possible to all States likely to be affected and to concerned international organizations.
- (c) Remote-sensing data or information derived therefrom should not intentionally be used by States to the detriment of other States.<sup>36</sup>

Also at its 1976 session, the WG addressed for the first time the terms which would be key to an understanding and application of whatever principles might ultimately be agreed to, including "data," "information," "the natural resources of the Earth," and "the natural environment of the Earth."<sup>37</sup> In turn this led the S & T Subcommittee, at its 1977 session, to adopt "for the purposes of discussion and analysis the following structure for describing in an orderly manner the system elements and data flow involved in remote sensing from satellites currently being operated:

1. Data acquisition (satellites and command stations)
2. Data reception (antennae and receivers)
3. Data pre-processing (formatting and recording)
4. Data storage and dissemination (archiving and reproduction)
5. Data analysis (interpretation or user processing)
6. Information utilization (practical application by users)."<sup>38</sup>

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<sup>35</sup>U.N. Doc. A/AC. 105/171 (28 May 1976), Annex III, p. 2. The WG also received a working paper from Mongolia, U.N. Doc. A/AC. 105/C.2/L. 107, reading as follows:

States participating in remote sensing should respect the principle of full and permanent sovereignty of all States and peoples over their wealth and natural resources as well as their inalienable right to dispose of their natural resources.

<sup>36</sup>U.N. Doc. A/AC. 105/171 (28 May 1976), Annex III, p. 3.

<sup>37</sup>*Id.*, at 4.

<sup>38</sup>U.N. Doc. A/AC. 105/195 (1 March 1977), pp. 8 and 9.

The S & T Subcommittee then went on to rewrite the definitions of "data" and "information" that had been used by the WG, replacing the term "data" with "primary data," and the term "information" with "analyzed information" as follows:

- (1) The term 'primary data' means those data which are acquired by satellite-borne remote sensors and transmitted from a satellite either by telemetry in the form of electro-magnetic signals or physically in any form such as photographic film or magnetic tape, as well as the pre-processed products derived from those data which may be used for later analysis;
- (2) The term 'analysed information' means the end-product resulting from the analytical process performed on the primary data combined with data and knowledge obtained from sources other than remote sensing satellites.<sup>39</sup>

The S & T Subcommittee noted that "with the present state-of-the-art systems, the term 'primary data' referred to the products generated in system elements 1 through 4 listed above and transformed into 'analyzed information' in element 5."<sup>40</sup> The definitions, as thus rewritten by the S & T Subcommittee, were presented by Sweden to the Legal Subcommittee at its 1977 session,<sup>41</sup> but time did not permit their detailed consideration by the WG.

Also at the 1977 session of the S & T Subcommittee, the USSR submitted a working paper which introduced the concept of classifying remote sensing data on the basis of spatial resolution as follows:

- 'Global' information, with spatial resolution ranging from several hundred metres to several kilometres, and covering distances ranging from several hundred kilometres to 2,000-3,000 kilometres;
- 'Regional' information, with spatial resolution ranging from 50-100 to 300-500 metres, and covering distances ranging from 180-200 to 600-800 kilometres;
- 'Local' information, with spatial resolution ranging from several metres to 30-50 metres, and covering distances of less than 150-180 kilometres.

The Soviet paper is reproduced in Appendix XI.<sup>42</sup> As noted in the Report of the S & T Subcommittee:

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<sup>39</sup>*Id.*, p. 9. The definitions formulated by the S & T Subcommittee were based on a working paper submitted by Sweden, U.N. Doc. A/AC. 105/C. 1/L. 95.

<sup>40</sup>*Id.*, p. 10.

<sup>41</sup>U.N. Doc. A/AC. 105/196 (11 April 1977), Annex III, p. 7.

<sup>42</sup>U.N. Doc. A/AC. 105/C. 1/L. 94 (15 February 1977).

There was no agreement in the Subcommittee on the concept that such classifications were necessary nor that they should be made on the basis of spatial resolution, nor on appropriate numerical values to be applied to the resolution for each of the categories.<sup>43</sup>

At the 1977 meeting of the Legal Subcommittee, the WG added several draft principles to five formulated at its 1976 meeting,<sup>44</sup> including an unnumbered and entirely bracketed principle based on the working paper submitted by Mongolia.<sup>45</sup> These additional draft principles are reproduced in Appendix XII.<sup>46</sup>

During its 1977 session, the full COPUOS took note of the definitions of "primary data" and "analyzed information" that had been formulated by the S & T Subcommittee and recommended that the Legal Subcommittee adopt those definitions.<sup>47</sup> The COPUOS also noted that the S & T Subcommittee had discussed the Soviet proposal "to classify remote sensing data into three categories—global, regional and local—based on spatial resolution," but that there was "no agreement in the Subcommittee on the concept or the need for such classification or that they should be made solely on the basis of spatial resolution."<sup>48</sup> In this connection, as stated in the 1977 COPUOS report:

The Committee agreed with the view of the Subcommittee that an attempt should, however, be made on scientific bases to provide a technical definition of spatial resolution and to determine what aspects of data, such as resolution, spectral characteristics, polarization, etc., may correspond to particular applications. The Committee therefore endorsed the recommendation of the Subcommittee that the Secretariat should conduct a study on the matter, which would be discussed by the Subcommittee at its next session.<sup>49</sup>

Such a study was completed by the Secretariat, with the assistance of the COSPAR (the Committee on Space Research, International Council of Scientific Unions), and the report of the study<sup>50</sup> was considered during the 1978 session of the S & T Subcommittee. As stated in the report of that session:

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<sup>43</sup>*Supra* note 40.

<sup>44</sup>See Appendix X.

<sup>45</sup>*Supra* note 35.

<sup>46</sup>The draft principles in their entirety are found at U.N. Doc. A/AC. 105/196 (11 April 1977), Annex III, pp. 4-6.

<sup>47</sup>U.N. Doc. A/32/20 (9 August 1977), p. 9.

<sup>48</sup>*Ibid.*

<sup>49</sup>*Ibid.*

<sup>50</sup>U.N. Doc. A/AC. 105/204.

The study covers the concept of resolutions such as spatial, temporal, radiometric and spectral resolutions, and their applications in remote sensing surveys. It also considers remote sensing systems/sensors which have either been flown aboard spacecraft or simulated through aircraft data. The sensors considered include those that apply to photographic, television and multispectral scanning systems (MSS) as well as radar systems, to a lesser extent. The performance demonstrated by these systems are also discussed. The study notes that information currently available is not sufficient to permit exact determination of technical parameters required of remote sensing systems in order to achieve specific applications objectives.

The Subcommittee, however, noted the view of some delegations that this report had some shortcomings and, in this connection, noted in particular the information brought to its attention by the delegation of Belgium that angular resolution of an optical system was proportional to the diameter of the aperture and inversely proportional to the wavelength. One should bear in mind that the higher the resolution, the smaller the object to be detected might be. It also noted that according to experience gained so far in comparing the imaging capability of photographic systems and scanner systems, the ratio between the photographic spatial resolution and the instantaneous field of view (IFOV) of a scanner as well as television resolution was approximately between two and three to one.<sup>21</sup>

The discussion of spatial resolution during the 1978 S & T Subcommittee meeting brought into sharp focus the different views on its significance. Those views were summarized in the Subcommittee's report:

In the view of some delegations there was no simple or practical scientific basis for categorizing remote sensing data according to its applications into global, regional and local classifications on the basis of spatial, temporal, spectral or radiometric resolution. Other delegations expressed the view that although such classifications might not be based on spectral and spatial resolution, it could be made taking into account other parameters as well. Some delegations felt that, in any event, there was no need to classify data into global, regional and local. Still other delegations expressed the view that it was important to have such a classification and that spatial resolution is the key parameter for classifying remote sensing data.

Several delegations were of the view that a sensing State possessing primary data about a sensed State finer than a certain spatial photographic resolution should not disseminate such data to a third State without the permission of the sensed State. The Soviet Union and some other delegations suggested that the appropriate limit might be 50 metres (*in case* photographic resolution, which meant in the definition given by the Soviet Union 'the smallest size of an object that still could be seen on a photograph'), since open dissemination of data with resolution finer than 50 metres might affect the economic and/or defence interests of sensed States. In this connection, the United States delegation noted that in the course of the United States Skylab programme (1973-1974) photographic imagery of several areas of the earth had been collected with photographic resolution in the range of 15 to 20 metres. This imagery has been available and disseminated on the same basis as Landsat data and up to the present time the United States was unaware of any difficulties having arisen. Some delegations felt that satellite-sensed primary data, irrespective of their spatial resolution, ought to be openly disseminated in order to give all States equal access to all data. Some delegations noted that, in any case, primary data or analyzed information should be accessible to the sensed State before being disseminated to a third party. Some delegations felt that

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<sup>21</sup>U.N. Doc. A/AC.105/216 (6 March 1978), p. 7.



dissemination of primary data as well as analyzed information to third parties should not be to the detriment, economically or otherwise, of the sensed States. The United States and some other delegations expressed the view that analyzed information was the work product of and the property of the analyzer and therefore could not be treated in the same manner as primary data.<sup>52</sup>

As a result, the S & T Subcommittee

was not in a position to agree upon specific recommendations on the need for classification of data nor the manner in which such a classification may be made. The Subcommittee, however, noted the suggestion that the work in this field initiated by COSPAR could be continued theoretically and experimentally to gather relevant information to relate different classes of data with various applications as well as further elaboration on the relationship of system characteristics, spatial resolution, and instantaneous field of view, and agreed that the Secretariat should be requested to submit a supplemental study thereon to the Subcommittee for consideration at its next session.<sup>53</sup>

During the 1978 session of the Legal Subcommittee, the WG made several significant changes to the 1977 draft principles. It incorporated the S & T Subcommittee's definitions of "primary data" and "analyzed information" and added a new definition of the term "remote sensing of the earth," but with the clear understanding, as documented in footnotes, that there was no final agreement on the definitions.<sup>54</sup> The definitions were added as a new Principle I, and the earlier Principles I through XI (Appendices X and XII) were renumbered II through XII, respectively, and included with only minor amendments. The WG added several draft principles, but since there was no agreement on these principles, each was set off in its entirety by square brackets. The new draft principles included Principle XIII on "full and permanent sovereignty of all States and peoples over their wealth and natural resources;"<sup>55</sup> Principle XIV on "advance notification to a State whose territory will be sensed;" Principle XV on "consultations" between the sensing and the sensed State;<sup>56</sup> Principle XVI on dissemination of remote sensing data or information;<sup>57</sup> and Principle XVII on disputes.<sup>58</sup> The entire set of principles reported by the 1978 WG are reproduced in Appendix XIII.<sup>59</sup>

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<sup>52</sup>*Id.* at 7 and 8.

<sup>53</sup>*Id.* at 8.

<sup>54</sup>U.N. Doc. A/AC. 105/218 (13 April 1978), Annex III, p. 5.

<sup>55</sup>Draft Principle XIII was based on the 1976 Mongolian proposal, *supra* note 35.

<sup>56</sup>Draft Principle XV was based on a working paper submitted to the WG by Mongolia, WG. III (1978) WP. 1.

<sup>57</sup>Draft Principle XVI was based on a working paper submitted by Chile, Nigeria and Sierra Leone.

<sup>58</sup>Draft Principle XVII was based on a working paper submitted by Austria.

<sup>59</sup>*Supra* note 54, at pp. 5-8.

Given the scope of the principles drafted, albeit without reaching any agreement at the 1978 session of the WG, the efforts of the WG during the 1979 session of the Legal Subcommittee centered around a consideration of several working papers submitted by a number of States.<sup>60</sup>

These working papers, which are reproduced in Appendix XIV, included:

A proposal of the USSR to establish a prior-consent regime for "primary remote-sensing data with a spatial resolution of 50 meters or finer and to analyzed remote-sensing information obtained on the basis of such data." The express consent of the sensed State would be required before such data or information could be published or given to another State;<sup>61</sup>

A proposal of the USSR which would require a sensing State to inform a sensed State of the data required, and to transfer those data to the sensed State by mutual agreement;<sup>62</sup>

A proposal of Romania which would give the sensed State the right of access to the data and information relating to its territory, the right without conditions to "consult recordings" relating to its territory, and the right to receive images at "reasonable prices;"<sup>63</sup>

A proposal of Romania that would require "full respect for the principle of permanent sovereignty of all States and all peoples over their wealth and their natural resources and for their inalienable right to dispose of them, including the right of access to information relating to them;"<sup>64</sup>

A proposal of the U.S. which would require a sensing State, to the extent feasible, to furnish the Secretary-General information on the nature of the remote-sensing program and the geographic area covered, would require the Secretary-General to publish such information, and would require the sensing State to furnish such information as soon as practicable to any State which so requested. To the extent feasible and practicable, the Secretary-General would be given advance notification of a State's intention to conduct a remote sensing program;<sup>65</sup>

A proposal of the USSR to rewrite the definition of "remote sensing of the earth from outer space" as follows:

The term 'remote sensing of the earth from outer space' means observations and measurements of energy and polarization characteristics of self-radiation and reflected

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<sup>60</sup>U.N. Doc. A/AC. 105/240 (10 April 1979), Annex I, pp. 12 and 13 and Annex IV, p. 1.

<sup>61</sup>WG. III (1979)/WP. 1/Rev. 1.

<sup>62</sup>WG. III (1979)/WP. 3.

<sup>63</sup>U.N. Doc. A/AC. 105/C. 2/L. 122 (26 March 1979).

<sup>64</sup>U.N. Doc. A/AC. 105/C. 2/L. 123 (26 March 1979).

<sup>65</sup>WG. III (1979)/WP. 7.

radiation of elements of the land, ocean and atmosphere of the earth in different ranges of electromagnetic waves which facilitate the location, description of the nature and temporal variations of natural parameters and phenomena, natural resources of the earth, the environment as well as anthropogenic objects and formations.<sup>66</sup>

A proposal of Romania and Iraq that "data and/or information obtained by remote sensing of the earth concerning a natural disaster shall be disseminated as promptly as possible to those States affected or likely to be affected."<sup>67</sup>

With respect to the principles themselves, the 1979 WG removed the square brackets from the words "primary" and "analyzed" in Principles I, but retained the footnotes; added a new paragraph to Principle VIII in square brackets along the lines of the Romania/Iraq proposal on the dissemination of remote sensing data and/or information obtained *during* and *after* natural disasters; and renumbered Principles XIII, XIV, XV and XVI as Principles XVI, XIII, XIV, XV, respectively. The principles, as they were set forth in the 1979 Legal Subcommittee report,<sup>68</sup> are reproduced in Appendix XV.

At its 1979 session, the full COPUOS noted that despite the progress on drafting remote sensing principles, "several key issues remained to be agreed upon before the draft principles could be finalized."<sup>69</sup> It recommended that the Secretariat continue its efforts in conjunction with COSPAR "to gather relevant information to relate different classes of data with various applications as well as to elaborate further on the relationship of system characteristics, spatial resolution, instantaneous field of view modulation transfer functions and the new concept of effective resolution element."<sup>70</sup>

The S & T Subcommittee, at its 1980 session in February, continued its consideration of ways to classify remote-sensing data. It concluded:

In relation to the classification of data for the purpose of dissemination, some delegations reiterated the view that one of the criteria for the classification of the data could be the types of application for which the data would be used.

Some delegations expressed the view that there are no objective scientific or technical reasons for classifying primary data in some rigid fashion into categories which could be subjected to different dissemination rules.

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<sup>66</sup>WG. III (1979)/WP. 9.

<sup>67</sup>WG. III (1979)/WP. 11.

<sup>68</sup>U.N. Doc. A/AC. 105/240 (10 April 1979), Annex I, pp. 7-11.

<sup>69</sup>U.N. Doc. A/34/20 (14 August 1979), p. 7.

<sup>70</sup>*Id.* at 5. The Secretariat had submitted a follow-on report on the "Characteristics and capabilities of sensors for earth resources surveys" for the consideration of the S & T Subcommittee at its 1979 Session, U.N. Doc. A/AC. 105/204/Add. 1 and Coord. 1.

Some delegations expressed the view that very little public information exists about certain very high resolution earth observation systems. Unless such information is taken into account while discussing the issue of classification of data, the Subcommittee might find it difficult to arrive at concrete results.<sup>71</sup>

The Subcommittee went on to discuss the replies it had received on its request for possible definitions of the terms "coarse," "medium," and "fine" as applied to spatial resolution in remote sensing. Based on these replies, it concluded:

In summary, the view of those Governments who replied was that these terms cannot be given precise quantitative definitions and that these concepts, which should only be used in a relative sense, may require different definitions depending upon applications.<sup>72</sup>

During the meeting of the Legal Subcommittee in 1980, the WG "agreed that it would for the time being leave aside those principles on which tentative agreement had already been reached and would consider the remaining principles, namely, Principles I, VIII, IX, XI, XII, XIII, XIV, XV and XVII, with the understanding that any of the remaining principles could be referred to by any delegation."<sup>73</sup> Based on the work of an informal drafting group, the Legal Subcommittee was able to reach agreement on a revised Principle VIII on the use of remote sensing primary data and/or analyzed information in notifying other States of impending natural disasters or in assisting them in dealing with such disasters. The newly agreed upon Principle VIII, which appears in the latest draft of the Principles (Appendix I), reads as follows:

Remote sensing of the earth from outer space should promote the protection of mankind from natural disaster. To this end, States which have identified primary data from remote sensing of the earth and/or analyzed information in their possession which would be useful in helping to alert States to impending natural disasters, or in assisting States to deal with natural disasters should, as promptly as possible, notify those States affected or likely to be affected of the existence and availability of such data and/or information. Such data and/or information should, upon request, be disseminated as promptly as possible.<sup>74</sup>

A footnote was added that the meaning of the term "natural disaster" was "subject to further discussion."<sup>75</sup> Nevertheless it was clear—based on information provided by a representative of the Office of the United Nations Disaster Relief Coordinator (UNDRO) and discussions of the WG—that "the concept of natural disaster normally refers to a sudden event with catastrophic effects upon large numbers of people such as

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<sup>71</sup>U.N. Doc. A/AC. 105/267 (15 February 1980), p. 10.

<sup>72</sup>*ibid.*

<sup>73</sup>U.N. Doc. A/AC. 105/271 (10 April 1980), Annex II, p. 1.

<sup>74</sup>*Id.* at 9.

<sup>75</sup>*ibid.*

an earthquake, flood, hurricane, tidal wave or a volcanic eruption, but it could occasionally refer also to man's impact upon the environment as in the case of a fire or an aircraft accident."<sup>76</sup>

No progress toward consensus was made during the 1980 session of the WG in its consideration of the question relative to dissemination of data and of that concerning the need for or method of classifying remote sensing data based on spatial resolution.

During the 1980 session of the full COPUOS, some delegations expressed concern about the lack of progress on these questions, with one delegation expressing the view that "the lack of progress in this area was due to the fact that the discussions in the Committee and its subsidiary bodies did not taken into account the total range of earth observation satellites extending from meteorological satellites to surveillance satellites."<sup>77</sup> The COPUOS endorsed the request of the S & T Subcommittee, in connection with the classification of remote sensing data, that the International Society of Photogrammetry "review the definitions of 'effective radiometric resolution element' (ERRE) and 'spatial effective resolution element' (SERE), and to inform the Subcommittee, at its next session, of more precise definitions of these concepts, if any."<sup>78</sup> The COPUOS also urged the Legal Subcommittee to continue its efforts on remote sensing principles at its next session.

### *Conclusion*

Over the past several years, the COPUOS and its Legal and S & T Subcommittees have achieved significant progress in drafting and reaching consensus on several important legal principles on remote sensing. Further progress has been limited, not by a lack of technical or drafting skills on the part of delegations to the COPUOS and its Subcommittees, but instead because of strongly held divergent views on key issues. Realistically, however, the failure of COPUOS to reach a consensus on the remaining issues has not in any appreciable way inhibited real international progress in the widespread and effective use of our ability to view the earth from the vantage point of space.

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<sup>76</sup>*Id.* at 2.

<sup>77</sup>U.N. Doc. A/35/20 (7 August 1980), p. 6.

<sup>78</sup>*Ibid.*

## APPENDIX I

(U.N. Doc. A/AC. 105/271 (10 April 1980), Annex II, pp. 7-11)

TEXT OF DRAFT PRINCIPLES WITH RESPECT TO REMOTE  
SENSING OF THE NATURAL RESOURCES OF THE EARTH AND  
ITS ENVIRONMENT AS CONTAINED IN THE REPORT OF THE  
LEGAL SUBCOMMITTEE ON THE WORK OF ITS 1980 SESSION

Principle I<sup>1</sup>

For the purpose of these principles with respect to remote sensing of the natural resources of the earth and its environment:<sup>2</sup>

(a) The term "remote sensing of the earth" means "remote sensing of the natural resources of the earth and its environment."<sup>3</sup>

(b) The term "primary data" means those primary data which are acquired by satellite-borne remote sensors and transmitted from a satellite either by telemetry in the form of electromagnetic signals or physically in any form such as photographic film or magnetic tape, as well as preprocessed products derived from those data which may be used for later analysis.

(c) The term "analysed information"\* means the end-product resulting from the analytical process performed on the primary data as defined in paragraph (b) above combined with data and/or knowledge obtained from sources other than satellite-borne remote sensors.

## Principle II

Remote sensing of the earth from outer space and international co-operation in that field [shall] [should] be carried out for the benefit and in the interests of all countries, irrespective of their degree of economic or scientific development, and taking into consideration, in international co-operation, the particular needs of the developing countries.

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\*The content, definition and necessity of the term "analysed information" is still to be clarified.

<sup>1</sup>The question of the application of these principles to international intergovernmental organizations will be considered later.

<sup>2</sup>The formulation "with respect to remote sensing of the natural resources of the earth and its environment" will be reviewed in light of the title to be given to the principles.

<sup>3</sup>This term is still subject to further discussion. In the view of some delegations, it would be necessary in the future work to further define the meaning of the words "remote sensing of the earth and its environment."

### Principle III

Remote sensing of the earth from outer space [shall] [should] be conducted in accordance with international law, including the Charter of the United Nations and the Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies, and the relevant instruments of ITU.

### Principle IV

1. States carrying out programmes for remote sensing of the earth from outer space [should] [shall] promote international co-operation in these programmes. To this end, sensing States [should] [shall] make available to other States opportunities for participation in these programmes. Such participation should be based in each case on equitable and mutually acceptable terms due regard being paid to principles. . .

2. In order to maximize the availability of benefits from such remote sensing data, States are encouraged to consider agreements for the establishment of shared regional facilities.

### Principle V

Remote sensing of the earth from outer space [should] [shall] promote the protection of the natural environment of the earth. To this end States participating in remote sensing [should] [shall] identify and make available information useful for the prevention of phenomena detrimental to the natural environment of the earth.

### Principle VI

States participating in remote sensing of the earth from outer space [should] [shall] make available technical assistance to other interested States on mutually agreed terms.

### Principle VII

1. The United Nations and the relevant agencies within the United Nations system should promote international co-operation, including technical assistance, and play a role of co-ordination in the area of remote sensing of the earth.

2. States conducting activities in the field of remote sensing of the earth [shall] [should] notify the Secretary-General thereof, in compliance with article XI of the Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies.

### Principle VIII

Remote sensing of the earth from outer space should promote the protection of mankind from natural disaster.\*\*\* To this end, States which have identified primary data from remote sensing of the earth and/or analysed information in their possession which would be useful in helping to alert States to impending natural disasters, or in assisting States to deal with natural disasters should, as promptly as possible, notify those States affected or likely to be affected of the existence and availability of such data and/or information. Such data and/or information should, upon request, be disseminated as promptly as possible.

### Principle IX<sup>1</sup>

Taking into account the principles II and III above, remote sensing data or information derived therefrom [shall] [should] be used by States in a manner compatible with the legitimate rights and interests of other States.\*, \*\*

### Principle X

States participating in remote sensing of the earth either directly or through relevant international organization [shall] [should] be prepared to make available to the United Nations and other interested States, particularly the developing countries, upon their request, any relevant technical information involving possible operational systems which they are free to disclose.

### Principle XI

[States [shall] [should] bear international responsibility for [national] activities of remote sensing of the earth [irrespective of whether] [where] such activities are carried out by governmental [or non-governmental] entities, and [shall] [should] [guarantee that such activities will] comply with the provisions of these principles.]

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\*Some delegations were of the view that, for the sake of consistency it was necessary to consider this principle in the light of draft principles II and III.

\*\*A delegation reserved its position on removing the square brackets around the words "in a manner compatible with" and on the deletion of the words "not" and "to the detriment of."

\*\*\*The meaning of this term is subject to further discussion.

<sup>1</sup>Should be considered in connexion with the formulation of a principle on dissemination of data or information and subject to later discussion of the terms "information" and "data."



## Principle XII

A sensed State [shall] [should] have timely and non-discriminatory access to primary data obtained by remote sensing of the earth from outer space, concerning its territory, on [agreed] reasonable terms and [no later than] [before] access is granted to any third State<sup>1</sup>, <sup>2</sup> [To the greatest extent feasible and practicable,] this principle shall also apply to analysed information.]

## Principle XIII

[[A State which intends to conduct remote sensing of the earth from outer space shall give advance notification to the States whose territory will be sensed.] [A State [intending to conduct] [conducting] remote sensing activities of the earth from outer space shall notify the Secretary-General of the United Nations and [upon request] the States whose territory is intended to be covered by such activities [to the fullest extent feasible and as soon as practicable] of the intended launch, [nature of the] mission, duration and coverage of such activities. The Secretary-General shall publish information thus received.]]

## Principle XIV

[A State carrying out remote sensing of the earth [shall] [should] without delay consult with a State whose territory is sensed upon request of the latter in regard to such activity, [in particular dissemination of data and information,] in order to promote international co-operation, friendly relations among States and to enhance the mutual benefits to be derived from this activity.]

## Principle XV

[States carrying out remote sensing of the earth shall not, without the approval of the States whose territories are affected by these activities, disseminate or dispose of any data or information on the natural resources of these States to third States, international organizations, public or private entities.]

## Principle XVI

[Without prejudice to the principle of the freedom of exploration and use of outer space, as set forth in article I of the Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies, remote sensing of the earth [should] [shall] be conducted with respect

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<sup>1</sup>The question of from which States access to and provision of data should be obtained, needs further consideration.

<sup>2</sup>Subject to review in the light of the discussion on access by third States.

for the principle of full and permanent sovereignty of all States and peoples over their own wealth and natural resources [with due regard to the rights and interests of other States and their natural and juridical persons in accordance with international law] [as well as their inalienable right to dispose of their natural resources] [and of information concerning those resources]].

#### Principle XVII

[Any dispute that may arise with respect to the application of [activities covered by] these principles [shall] [should] be resolved by prompt consultations among the parties to the dispute. Where a mutually acceptable solution cannot be found by such consultations it [shall] [should] be sought through other [established] [existing] procedures for the peaceful means of settlement of disputes mutually agreed upon by the parties concerned.]\*

#### APPENDIX II

(U.N. Doc. A/AC. 105/111 (14 Feb. 1973), pp. 11-12)

#### USSR PRELIMINARY DRAFT OF LEGAL PRINCIPLES TO BE APPLIED BY STATES UTILIZING SPACE TECHNOLOGY IN EXPLORING THE RESOURCES OF THE EARTH

1. Activities connected with the exploration of the natural resources of the earth by means of space technology shall be conducted in conformity with the principles of international law, including the United Nations Charter, and in the interests of peace and progress for all peoples.

2. States which utilize space technology for the purpose of exploring the resources of the earth shall undertake to respect the sovereignty of other States and, in particular, their inalienable right to control their own natural resources as well as information concerning such resources.

3. International co-operation in the utilization of space technology for the purpose of exploring the natural resources of the earth must promote the independent economic development of all States and shall be based on respect by States for each other's interests.

4. A State which engages in exploration of the natural resources of the earth by means of space technology and, in the course of such activities, obtains information

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\*Subject to review in the light of the full set of agreed principles and a decision on the legal nature of the principles.

concerning the natural resources of another State shall be required to transmit such information to the latter State under mutually acceptable conditions.

5. A State which, by means of space technology, obtains information concerning the natural resources of another State shall not be entitled to make such information public or transmit it to a third State or international organization without the express consent of the State to which these natural resources belong or to utilize the information in any other manner to the detriment of the latter State.

#### APPENDIX III

(U.N. Doc. A/AC.105/C.1/WG.4/L.6 (28 Nov. 1973), pp. 13 and 14)

#### SUBMISSION OF CANADA TO THE COPUOS SECRETARIAT ON "POSSIBLE OPTIONS" ILLUSTRATING RIGHTS AND OBLIGATIONS REGARDING THE THREE PHASES OF REMOTE SENSING BY SATELLITE

##### *Sensing phase*

- (1) Complete freedom for sensing States and an absence of rights for sensed States;
- (2) A right for sensed States to be informed that their territories are being sensed, with a concomitant duty for the sensing States fully to disclose information about their programmes-but without the right for sensed States to object;
- (3) A right for sensed States to participate in programme formulation and implementation;<sup>6</sup>
- (4) A right for sensed States to be informed while the sensing is taking place, and to object on the grounds that it would be contrary to the national interest to reveal certain features of their territories;
- (5) A requirement of the sensed States' consent before sensing.

##### *Receipt of raw data and processing phase*

- (1) An absence of rights for sensed States to determine whether, to whom and under what conditions raw data pertaining to their territories will be distributed for processing;
- (2) Universal and expeditious dissemination of all raw data by sensing States;

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<sup>6</sup>This option might also be considered under subsequent phases.

(3) Priority of access by sensed States to raw data pertaining to their territories, involving the right to receive such data as soon as they become available to the sensing States;

(4) Exclusive rights for sensed States in raw data pertaining to their territories, including the right to determine their distribution.

*Dissemination and interpretation of processed data*

(1) Universal and expeditious dissemination by sensing States of all processed data;

(2) Priority of access by sensed States to processed data pertaining to their territories, involving the right to receive such data as soon as processed;

(3) Exclusive rights for sensed States to receive processed data pertaining to their territories and to determine their dissemination;

(4) Universal and expeditious dissemination by States which have developed advance interpretation methods of information regarding such methods.

APPENDIX IV

(U.N. Doc. A/AC. 105/133 (6 June 1974), Annex IV, pp. 1-3;  
U.N. Doc. A/AC. 105/C.2/L.73)

TEXT OF DRAFT OF ARGENTINA ON INTERNATIONAL  
AGREEMENT ON ACTIVITIES CARRIED OUT THROUGH  
REMOTE-SENSING SATELLITE SURVEYS OF EARTH  
RESOURCES

*The States Parties to the present Agreement:*

*Considering* that there is an urgent need for over-all surveys of earth resources by means of remote sensors installed in satellites and that the expected benefits will only be obtained through a general international convention and agreements on collaboration,

*Further considering* that the principal economic assets of any country are human and natural resources, provided that these are identified and used,

*Convinced* that the promise of such benefits raises legal problems which must be solved without delay,

*Reaffirming* that these new techniques will act as an effective stimulus to economic and social development, and materially contribute to the welfare of all mankind by enabling the inventory, planning, development, exploitation and conservation of natural resources to be undertaken on the basis of international co-operation.

*Bearing in mind* United Nations General Assembly resolution 2600 (XXIV) of 16 December 1969, which is concerned, in particular, with the techniques of remote earth resources surveying, and requests greater international co-operation with a view to reaping practical benefits from the new technology,

*Believing* that the rights of the States to which the resources belong should be established at the international level in relation to collective consumption requirements,

*Recalling* United Nations General Assembly resolution 1314 (XIII) of 12 December 1958, which declares that the permanent sovereignty of peoples and nations over their natural wealth and resources is a basic constituent of the right to self-determination.

*Inspired* by the Treaty on the Principles Governing the Activities of States in the Exploration and Use of Outer Space including the Moon and Other Celestial Bodies, of 27 January 1967,

*Have agreed on the following:*

#### Article I

The techniques of remote-sensing satellite inventory and study of earth resources shall be used in close international co-operation for the benefit of all mankind.

#### Article 2

Until such time as some other appropriate body is available, the United Nations Secretariat shall be responsible for the functions of planning, consultation, information, inventorying and co-ordination of such activities in the initial stage to meet immediate needs, with a view of internationalizing over-all surveys of resources.

#### Article 3

A data bank shall be established for that purpose, to which all States shall have access. When appropriate, the data bank shall disseminate on a world-wide basis the findings and practical results in respect of the use of such techniques to inventory and survey earth resources, with special reference to the interests and needs of the developing countries.

#### Article 4

The programmes for world-wide remote sensing will prevent the exploitation of natural resources from causing the spoliation or destruction of the environment, and will make for the preservation of a satisfactory balance through the increase of renewable resources in those areas which are best able to help maintain it.

## Article 5

Until remote-sensing satellite surveys of earth resources have been placed on an international footing, the activities of the States which undertake such surveys must be based on the principle of equality between States and of the honourable fulfilment of international commitments, as well as the other principles of international law regarding friendly relations and co-operation between States.

## Article 6

Surveys of natural resources and their findings with respect to the sea beyond State jurisdiction or of the ocean floor and subsoil beyond the limits of national jurisdiction shall be transmitted to the data bank. If the surveys involve the national territory and jurisdictional waters of one or more States, the facts and findings shall be promptly communicated to the State or States concerned and transmitted to the data bank.

## Article 7

The principle of equality of rights and the self-determination of peoples embraces not only the right to internal sovereignty and independence, but also the economic aspect of the freedom to use and distribute their wealth, whereby the peoples may exercise their legitimate and exclusive rights over their natural resources. By virtue of this principle, the States shall exchange information among themselves on the discovery of new areas or of improved methods of exploiting natural resources, and shall transmit such information to the data bank.

## Article 8

The exploitation of the natural resources of each State in its territory and in its jurisdictional waters shall be governed solely by national laws and regulations. Efforts shall be made by means of international agreements to improve the distribution of the resources and to plan concerted action to meet collective consumption requirements, with respect to the basic elements for subsistence essential raw materials and natural processes the knowledge of which would raise mankind's level of living.

## APPENDIX V

(U.N. Doc. A/AC.105/133 (6 June 1974), Annex IV, pp. 3-5;  
U.N. Doc. A/AC.105/122)

PROPOSAL OF BRAZIL ON TREATY ON REMOTE SENSING OF  
NATURAL RESOURCES BY SATELLITES

1. National and international programmes for remote sensing of natural resources by satellites shall promote international co-operation and their implementation shall

benefit and serve the interests of all countries, taking especially into consideration benefits to and the interests of the developing countries.

2. States Parties shall carry out activities of remote sensing of natural resources by satellites in accordance with international law, including the Charter of the United Nations, the Treaty on Principles Governing the Activities of States on the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies, and the principles contained in the resolutions of the United Nations General Assembly concerning permanent sovereignty of peoples and nations over their natural resources, in particular resolutions 1803 (XVII), of 14 December 1962, and 2158 (XXI), of 25 November 1966.

3. States Parties shall refrain from undertaking activities of remote sensing of natural resources belonging to another State Party, including the resources located in maritime areas under national jurisdiction, without the consent of the latter.

4. States Parties are entitled to take measures, in accordance with international law, to protect their territory and maritime areas under their jurisdiction from remote sensing activities for which they had denied their consent.

5. States Parties whose territory and maritime areas under their jurisdiction are the object of remote sensing of natural resources are entitled, if they so request, to participate in those activities.

6. States Parties whose territory and maritime areas under their jurisdiction are the object of remote sensing of natural resources are entitled to full and unrestricted access to all data obtained through those activities.

7. States Parties obtaining information relating to the natural resources of another State Party through remote sensing shall neither divulge such information nor transmit or transfer it in any manner to a third State, international organization or private entity, without the express authorization of the State Party to which the natural resources belong, nor can they utilize the information thus obtained to the detriment of the latter.

8. States Parties shall refrain from soliciting, accepting and, in any manner, receiving from a third State, international organization or private entity, information regarding the natural resources of another State Party obtained through remote sensing without the express authorization of the State Party to which the natural resources belong; nor can they utilize such information to the detriment of the latter.

9. States Parties possessing the technological capability for remote sensing shall endeavour to assist other States Parties lacking this technology in the implementation of national programmes for surveying natural resources planned by the latter.

10. States Parties acknowledge the right of all States to participate fully in activities of remote sensing of natural resources of terrestrial and maritime areas outside national sovereignty or jurisdiction, as well as the need to guarantee free access to information obtained through these activities.

11. States Parties shall be held internationally responsible for national activities of remote sensing of natural resources, irrespective of whether such activities are carried out by governmental or non-governmental entities, and shall guarantee that such activities will comply with the provisions of the present treaty.

12. Disputes resulting from activities of remote sensing of natural resources shall be resolved in accordance with the methods envisaged in Article 33 of the Charter of the United Nations.

13. States Parties are entitled to conclude agreements in conformity with stipulations of the present treaty.

14. Nothing in these articles shall affect the rights and obligations contracted by States Parties through bilateral or regional agreements.

#### APPENDIX VI

(U.N. Doc. A/AC. 105/133 (6 June 1974), Annex IV, pp. 5 and 6;  
U.N. Doc. A/AC. 105/L.69)

#### DRAFT OF FRANCE ON PRINCIPLES GOVERNING REMOTE SENSING OF EARTH RESOURCES FROM OUTER SPACE

1. Outer space may be used freely by all States, without any discrimination, under conditions of equality and in accordance with international law, including the United Nations Charter and the 1967 Outer Space treaty, for engaging in the remote sensing of earth resources exclusively for peaceful purposes.

2. Such use shall, in particular, respect the principle of the sovereignty of States, with special reference to the right of permanent sovereignty of peoples and nations over their wealth and resources as a basic constituent of their right to self-determination, in accordance with the principles laid down in United Nations General Assembly resolutions 1803 (XVII) of 14 December 1962 and 2158 (XXI) of 25 November 1966.

3. Remote sensing of earth resources from outer space shall be carried out for the good and in the interests of all countries, whatever their state of economic or scientific development, and the results of such activity should contribute to an improvement in the balance of the natural environment.



4. Every State engaging in remote sensing of earth resources from outer space shall inform the Secretary-General of the United Nations of the date, duration, nature and objectives of that activity and of the areas which may be affected. In addition, every State whose territory or territorial sea is affected by remote sensing shall receive prior notification thereof from the State, States, or international organization responsible for such activity.

5. (1) Every State territorially affected by remote sensing of earth resources shall have the right, if it so requests, to participate therein on fair and reasonable terms. (2) Use of the documents resulting from a remote-sensing operation may not be granted to third parties, whether Governments or private persons, without the consent of the State whose territory is affected.

6. Where remote-sensing activities cover land or sea areas outside the jurisdiction of States, all States shall have the right to participate therein on fair and reasonable terms; they shall also have the right to receive the results of such activities, on the same terms, within the framework of an organized system of international co-operation.

#### APPENDIX VII

(U.N. Doc. A/AC. 105/133 (6 June 1974), Annex IV, pp. 9 and 10;  
U.N. Doc. A/AC. 105/C.2/L.99 (27 May 1974))

#### WORKING PAPER OF FRANCE AND USSR ON DRAFT PRINCIPLES GOVERNING ACTIVITIES OF STATES IN THE FIELD OF REMOTE SENSING OF EARTH RESOURCES BY MEANS OF SPACE TECHNOLOGY

1. Outer space shall be free for use by all States, without discrimination of any kind on a basis of equality and in accordance with international law, including the United Nations Charter and the 1967 Outer Space Treaty, for carrying out remote sensing of earth resources exclusively for peaceful purposes.

2. Such use shall, in particular, respect the principle of the sovereignty of States and especially the right of peoples and States to exercise permanent sovereignty over their wealth and resources as a basic element of their right to self-determination as well as their inalienable right to dispose of their natural resources and of information concerning those resources.

3. Activities in the field of remote sensing of earth resources from outer space and international co-operation in that field shall be carried out for the benefit and in the interests of all countries, irrespective of their degree of economic or scientific development, and their results should contribute to an improvement in the balance of the natural environment.

4. A State engaged in the exploration of natural resources by means of space technology which, in the course of such activities, obtained information on the natural resources of another State must transmit such information to the latter State on mutually acceptable terms.

5. (a) Any State whose territory is affected by activities connected with the remote sensing of earth resources may, in agreement with the State conducting the remote sensing, participate in those activities on equal and mutually acceptable terms.

(b) A State which obtains information concerning the natural resources of another State as a result of remote sensing activities shall not be entitled to make it public without the clearly expressed consent of the State to which the natural resources belong or to use it in any other manner to the detriment of such State. Documentation resulting from remote sensing activities may not be communicated to third parties, whether Governments, international organizations or private persons, without the consent of the State whose territory is affected.

(c) Exception from the principle contained in subparagraph (b) above is made for information on natural disasters and phenomena which can be detrimental to the environment in general.

6. All States shall be entitled on equal and mutually acceptable terms to receive and process data resulting from activities in the remote sensing of areas situated outside the national jurisdiction of any State. They shall also be entitled to access, on the same terms, to the results of such activities within the framework of institutionalized international co-operation.

7. Every State conducting activities in the field of remote sensing of earth resources shall inform the Secretary-General thereof, in accordance with article XI of the Outer Space Treaty.

#### APPENDIX VIII

(U.N. Doc. A/C.1/1047 (October 1974))

#### TEXT OF JOINT PROPOSAL OF ARGENTINA AND BRAZIL ON DRAFT BASIC ARTICLES FOR A TREATY ON REMOTE SENSING OF NATURAL RESOURCES BY MEANS OF TECHNOLOGY

The States Parties to this Treaty:

Considering that the global research of earth resources by means of space technology is an effective way of determining the existence and the location of these resources, as well as the possibilities of increasing them, with a view to cope with the growing scarcity of food and raw materials;

Considering further that the main economic assets of every State are its human and natural resources;

Convinced that the new techniques of remote sensing of earth resources, as an effective stimulus for economic and social development, will admittedly contribute to the well-being of humanity as a whole, and allow for international co-operation, taking particularly into account the needs and interests of the developing countries;

Conscious of the multiple and relevant international effects derived from the use of the technology of remote sensing of earth resources, which create legal problems that require an immediate and equitable solution in the framework of a general treaty and agreements on mutual co-operation;

Reaffirming the principles contained in the United Nations General Assembly resolutions concerning the permanent sovereignty of peoples and nations over their own natural resources, in particular resolutions 1803 (XVII) of 14 December 1962 and 2158 (XXI) of 25 November 1966;

Desiring to safeguard the exercise of the sovereign rights of States over their own natural resources;

Taking into account the principles of international law, the Charter of the United Nations and the Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies;

Have agreed on the following:

#### Article I

National and international programmes for remote sensing of natural resources by means of space technology shall promote international co-operation and their implementation shall benefit and serve the interest of all mankind, taking especially into consideration benefits to and the interest and needs of the developing countries.

#### Article II

States parties shall carry out activities of remote sensing of natural resources by means of space technology in accordance with the principles of international law, the Charter of the United Nations and the Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies.

### Article III

Programmes for world-wide remote sensing shall take into account the need to prevent the exploitation of natural resources from causing the spoliation or destruction of the environment.

### Article IV

Activities of remote sensing of natural resources by means of space technology must be based on the principle of sovereign equality of States and of the honourable fulfilment of international commitments, as well as other relevant principles of international law regarding friendly relations and co-operation among States. The principles of sovereign equality of States and self-determination of peoples embrace not only the right to internal sovereignty and independence, but also the economic aspect of the freedom to use and distribute their wealth, whereby peoples may exercise their legitimate and exclusive sovereign rights over their own natural resources.

### Article V

States parties shall refrain from undertaking activities of remote sensing of natural resources belonging to another State party, including the resources located in maritime areas under national jurisdiction, without the consent of the latter.

### Article VI

States parties will take all measures authorized by international law to protect their territory and maritime areas under their jurisdiction from remote sensing activities for which they had denied their consent.

### Article VII

States parties which have given consent for their territory and maritime areas under their jurisdiction to be the objects of remote sensing of natural resources are entitled to participate in those activities in a manner to be decided upon by specific arrangements between the parties concerned, which will include the guarantee of technical assistance to be provided by the sensing State to the sensed State during the whole process of these activities.

### Article VIII

States parties whose territory and maritime areas under their jurisdiction are the object of remote sensing of natural resources are entitled to full and unrestricted access to all data obtained through those activities.

## Article IX

States parties obtaining information relating to the natural resources of another State party through remote sensing shall neither divulge such information nor transmit or transfer it in any manner to a third State, international organization or private entity, without the express authorization of the party to which the natural resources belong, nor can they utilize the information thus obtained to the detriment of the latter.

## Article X

States parties shall refrain from soliciting, accepting or, in any manner, receiving from a third State, international organization or private entity, information regarding the natural resources of another State party obtained through remote sensing without the express authorization of the State party to which the natural resources belong, nor can they utilize such information to the detriment of the latter.

## Article XI

States parties possessing the technological capability of remote sensing shall endeavour to assist other States parties lacking this technology in the implementation of national programmes for surveying natural resources planned by the latter.

## Article XII

States parties acknowledge the right of all States to participate fully in activities of remote sensing of natural resources of territorial and maritime areas outside national sovereignty or jurisdiction, as well as the need to guarantee free access to all information obtained through these activities.

## Article XIII

States parties shall be held internationally responsible for national activities of remote sensing of natural resources, irrespective of whether such activities are carried out by governmental or non-governmental entities, and shall guarantee that such activities will comply with the provisions of the present treaty.

## Article XIV

Disputes resulting from activities of remote sensing of natural resources shall be resolved in accordance with the methods envisaged in Article 33 of the Charter of the United Nations.

## Article XV

States parties are entitled to elaborate international agreements confirming, completing and developing the provisions of the present treaty.

## Article XVI

Nothing in this treaty shall affect the rights and duties contracted by States parties through bilateral or regional agreements.

## APPENDIX IX

(U.N. Doc. A/AC. 105/C.2/L.103 (February 1975);  
Press Release USUN 10 (75) (19 February 1975))

WORKING PAPER BY THE UNITED STATES ON THE  
DEVELOPMENT OF ADDITIONAL GUIDELINES ON REMOTE  
SENSING OF THE NATURAL ENVIRONMENT OF THE EARTH  
FROM OUTER SPACE

## Possible Preambular Provisions:

Recalling the provisions of the Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, Including the Moon and Other Celestial Bodies,

Reaffirming that the common interest of mankind is served by the exploration and use of outer space for peaceful purposes,

Considering that international cooperation in the continuing development of technology enabling mankind to undertake remote sensing of the natural environment of the Earth from outer space may provide unique opportunities for all peoples to gain useful understanding of the Earth and its environment,

Recognizing that the most valuable potential advantages to mankind from these technological developments, including among others preservation of the environment and effective management and control by States of their natural resources, will depend on the sharing of data and its use on a regional and global basis.

Source: Statement by Ronald Stowe, United States representative to the Legal Subcommittee of UNCOPUOS. Press Release USUN 10 (75) February 19th, 1975.

## Possible Operative Provisions:

I. Remote sensing of the natural environment of the Earth from outer space shall be conducted in accordance with the principles of the United Nations Charter, the Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, Including the Moon and Other Celestial Bodies, and other generally accepted principles of international law relating to man's activities in outer space.

II. Satellites designed for remote sensing of the natural environment of the Earth shall be registered with the Secretary-General of the United Nations in accordance with the Convention on the Registration of Objects Launched into Outer Space. States shall as appropriate inform the Secretary-General of the progress of such remote sensing space programs they have undertaken.

III. Remote sensing of the natural environment of the Earth from outer space should promote *inter alia* (a) international cooperation in the solution of international problems relating to natural resources and the environment, (b) the development of friendly relations among States, (c) cooperation in scientific investigation, and (d) the use of outer space for the benefit and in the interest of all mankind.

IV. States undertaking programs designed for remote sensing of the natural environment from satellites shall encourage the broadest feasible international participation in appropriate phases of those programs.

V. States receiving data directly from satellites designed for remote sensing of the natural environment of the Earth shall make those data available to interested States, international organizations, individuals, scientific communities and others on an equitable, timely, and nondiscriminatory basis. To enhance the ability of all States, organizations and individuals to share in the knowledge gained from remote sensing of the natural environment from outer space, States should publish catalogues or other appropriate listings of publicly available data which they have received directly from such remote sensing satellites.

VI States receiving data directly from such remote sensing satellites shall ensure in particular that data of a sensed area within the territory of any other State are available to the sensed State as soon as practicable, and in any event as soon as they are available to any State other than the sensing States. States owning such remote sensing satellites shall facilitate the direct reception of data from those satellites by other interested States when technically possible and on equitable terms.

VII. States engaged in such remote sensing programs shall within their capabilities endeavor to assist on an equitable basis other interested States, organizations and individuals to develop an understanding of the techniques, potential benefits and costs of remote sensing. Such assistance could include the provision of opportunities to learn what data are available, how to handle and interpret the data, and, where appropriate, how to apply the knowledge gained to meet national, regional and global needs.

VIII. States should cooperate with other States in the same geographical region in the use of data from such remote sensing programs, whether regional or global in nature, to promote the common development of knowledge about that region.

IX. States which undertake such remote sensing programs should encourage relevant international organizations to which they belong to assist other member States

in acquiring and using data from those programs so that the maximum number of States can share in potential benefits which may result from the development of this technology.

#### APPENDIX X

(U.N. Doc. A/AC. 105/171 (28 May 1976) Annex III, pp. 2 & 3)

#### DRAFT PRINCIPLES ON REMOTE SENSING FORMULATED BY WORKING GROUP III OF THE LEGAL SUBCOMMITTEE AT ITS 1976 MEETING

##### Principle Ia

Remote sensing of [the natural resources of the earth] [and its environment] from outer space and international co-operation in that field [shall] [should] be carried out for the benefit and in the interests of all countries [mankind], irrespective of their degree of economic or scientific development, and taking into consideration, in international co-operation, the particular needs of the developing countries.

##### Principle IIb

Remote sensing of [the natural resources of the earth] [and its environment] from outer space [shall] [should] be conducted in accordance with international law, including the Charter of the United Nations and the Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and other Celestial Bodies.

##### Principle IIIc

1. States carrying out programmes for remote sensing of [the natural resources of the earth] [and its environment] from outer space [should] [shall] promote international co-operation in these programmes. To this end, sensing States [should] [shall] make available to other States opportunities for participation in these programmes. Such participation should be based in each case on equitable and mutually acceptable terms due regard being paid to elements. . .

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<sup>a</sup>Based on common element (a) of para. 7 of annex III to A/AC. 105/147.

<sup>b</sup>Based on common element (b) of para. 7 of annex III to A/AC. 105/147.

<sup>c</sup>Based on common element (c)-(d) of para. 7 of annex III to A/AC. 105/147.



2. In order to maximize the availability of benefits from such remote sensing data, States are encouraged to consider agreements for the establishment of shared regional facilities.

#### Principle IV<sup>d</sup>

Remote sensing [of the natural resources of the earth] [and its environment] from outer space [should] [shall] identify and make available information useful for the prevention of phenomena detrimental to the natural environment of the earth.

#### Principle V<sup>e</sup>

States participating in remote sensing of [the natural resources of the earth] [and its environment] from outer space [should] [shall] make available technical assistance to other interested States on mutually agreed terms.

### APPENDIX XI

(U.N. Doc. A/AC.105/C.1/L.94 (15 February 1977))

#### WORKING PAPER SUBMITTED BY USSR ON QUESTIONS RELATING TO REMOTE SENSING OF THE EARTH BY SATELLITES

There is as yet no generally accepted definition of the term "natural resources of the earth."

The following definition of the term is suggested in this paper:

The term "natural resources of the earth" refers to natural resources which form part of the whole aggregate of natural conditions of man's existence and important components of his natural environment and which are used in the process of social production in order to meet the material and cultural needs of society.

This definition is so broad and all embracing that virtually any information concerning the earth obtained by various means (including means employed in space) can be regarded as information which is used for the purpose of investigating the natural resources of the earth.

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<sup>d</sup>Based on common element (e) of para. 7 of annex III to A/AC.105/147.

<sup>e</sup>Based on a new common element identified by the Working Group at the present session of the Subcommittee.

The term "remote sensing of the earth by satellites" refers to observations and measurements of the energy and polarization characteristics of the inherent and reflected radiation of elements of the land and ocean areas and atmosphere of the earth in different ranges of electromagnetic waves which are of assistance in describing the location, nature and time variation of natural parameters and phenomena, of natural resources of the earth, of the environment and of man made objects and formations.

What this definition means in effect is that, in and of itself, "remote sensing of the earth by satellites" does not as a rule make it possible to obtain *data on natural resources* in a given area without undertaking extensive and often costly work with ground and aircraft devices in order to obtain the necessary *a priori* and *a posteriori* information.

Thus two conclusions may be drawn:

(1) Any information about the earth obtained by remote sensing with the use of means employed in space may be treated as information relating to investigation of the natural resources of the earth;

(2) No information concerning the earth obtained by remote sensing by satellites makes it possible in and of itself to obtain *data on natural resources* but can be *used only for* investigating the natural resources of the earth in combination with information obtained by means other than those employed in space.

In this connexion, discussion of the legal regulation of activities of States in the field of remote sensing of the earth by satellites suggests the following alternatives:

Rejection of any regulation of activities involving the dissemination and use of information obtained by means employed in space for investigating the earth;

The formulation of legal norms regulating activities of States involving the dissemination and use of any information obtained by means of remote sensing of the earth by satellite.

Neither of these alternatives is practicable because they are both too extreme.

Rejection of any legal regulation could lead, as discussion of the subject in the United Nations shows, to violation of the sovereign rights of any State to dispose of its natural resources and of information concerning them.

On the other hand, the acceptance of legal norms regulating all activities of States in this field could lead to unjustified curtailment of the amount, and lessening of the effectiveness of the use, of information obtained by satellite in fields of such great importance for all mankind as hydrometeorology, oceanography, and sun-earth relationships, which are virtually unrelated to the problems of sovereignty.

For this reason it seems appropriate to suggest a conventional division of information concerning the earth obtained by satellite into that which is subject to legal regulation and that which is not, on the basis of the possibility of obtaining from the information in question data for the study of natural resources affecting the sovereign rights of States.

Within the framework of this discussion, the conventional division of the descriptive information concerning the earth which is obtained from outer space in the visible spectrum could be the following:

—“Global” information, with space resolution ranging from several hundred metres to several kilometres, and covering distances ranging from several hundred kilometres to 2,000-3,000 kilometres;

—“Regional” information, with space resolution ranging from 50-100 to 300-500 metres, and covering distances ranging from 180-200 to 600-800 kilometres;

—“Local” information, with space resolution ranging from several metres to 30-50 metres, and covering distances of less than 150-180 kilometres.

With a view to effectively meeting the needs of the world community for space information concerning the earth, it is suggested that information of a “global” and “regional” character should be freely disseminated. It is also suggested that the free dissemination and utilization of “global” and “regional” information should not lead to violations of the sovereign rights of States to their natural resources and to information concerning those resources.

At the same time, an analysis of foreign and national research on the question of the study of the earth's natural resources by means of space technology (conducted by organs of the United Nations Outer Space Committee and in organizations in the USSR, the United States and other States) shows that, for the practical solution of the great majority of problems connected with the investigation of natural resources, users basically need information of a “local” character with space resolution of the order of 10 to 50 metres.

In fact, it will be seen from an analysis of the number of problems which can be solved with the help of space information as a function of the space resolution of the images (see figure 1) that in practice for most important problems what is required is pictures with a resolution of 10-50 metres. The graph in figure 1 reflects the space information requirements of such branches of the economy as: geology, agriculture and forestry, land improvement and water management, geography and cartography, fisheries and oceanography. These requirements will naturally differ from branch to branch and from country to country. It may be said, however, that the general trend shown in figure 1 will continue.

This means that it is information with resolution of 10-50 metres which will have the greatest effect on the most sensitive branches of the economy of the majority of States and their sovereign rights to their natural resources and to information on those resources.

Consequently, the dissemination by States of "local" information concerning the earth obtained from outer space with resolution of more than 50 metres should undoubtedly be subject to legal regulations in accordance with the principles already expounded by the USSR.

In view of the special needs of oceanography and fisheries, it should be possible to agree to the free dissemination of information relating to international waters with a resolution of not more than 10 metres.

The discussion of these proposals in the organs of the United Nations Outer Space Committee should make it possible to clarify and reconcile views concerning such a division of information, and subsequently to spell out and embody this division in a suitable legal instrument (treaty, agreement, principles).

#### APPENDIX XII

(U.N. Doc. A/AC. 105/196 (11 April 1977), Annex III, pp. 4-6)

#### ADDITIONAL DRAFT PRINCIPLES ON REMOTE SENSING FORMULATED BY WORKING GROUP III OF THE LEGAL SUBCOMMITTEE AT ITS 1977 MEETING

[For Principles I through V formulated at the Working Group's 1976 meeting, see Appendix X]

#### Principle VI

1. The United Nations and its relevant specialized agencies [and the International Atomic Energy Agency] [should] [shall] promote international co-operation, including technical assistance,<sup>a</sup> and play a role of co-ordination in the area of remote sensing of [the natural resources of the earth] [and its environment].

2. States conducting activities in the field of remote sensing of [the natural resources of the earth] [and its environment] [shall] [should] notify the Secretary-General thereof, in compliance with article XI of the Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and other Celestial Bodies.<sup>b</sup>

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<sup>a</sup>Depending on whether the Subcommittee believes that a separate principle should be developed on technical assistance.

<sup>b</sup>The question of application to international intergovernmental organizations will be considered later

### Principle VII

Information<sup>c</sup> obtained by remote sensing [of the natural resources of the earth] [and its environment] indicating an impending natural disaster shall be disseminated<sup>d</sup> as promptly as possible to those States likely to be affected.

### Principle VIII<sup>e</sup>

Taking into account the principles I and II above, remote sensing data or information derived therefrom [shall] [should] [not] be used by States [to the detriment of] [in a manner compatible with] the legitimate rights and interests of other States.

### Principle IX

States participating in remote sensing [of the natural resources of the earth] [and its environment], either directly or through relevant international organization [shall] [should] be prepared to make available to the United Nations and other interested States, particularly the developing countries, upon their request, any relevant technical information involving possible operational systems which they are free to disclose.

### Principle X

States [shall] [should] bear international responsibility for [national] activities of remote sensing [of the natural resources of the earth] [and its environment] [irrespective of whether] [where] such activities are carried out by governmental [or non-governmental] entities, and [shall] [should] [guarantee that such activities will] comply with the provisions of these Principles.

### Principle XI

A sensed State [shall] [should] have timely and non-discriminatory access to data obtained by remote sensing [of the natural resources of the earth] [and its environment] from outer space, pertaining to its territory on reasonable terms [to be mutually agreed upon with the sensing State] and to the extent feasible and practicable, [shall] [should] be provided with such data on such terms [on a continuous and priority basis] [and in any case no later than any third State].<sup>f</sup>

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<sup>c</sup>Subject to later discussion of the terms "information" and "data".

<sup>d</sup>Subject to further discussion after information concerning procedure of dissemination in the practice of the United Nations is received from the Secretariat.

<sup>e</sup>Should be considered in connexion with the formulation of a principle on dissemination of data or information and subject to later discussion of the terms "information" and "data".

<sup>f</sup>Subject to review in the light of the discussion on access by third States.

[Without prejudice to the principle of the freedom of exploration and use of outer space, as set forth in article I of the Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and other Celestial Bodies, remote sensing [of the natural resources of the earth] [and its environment] [should] [shall] be conducted with respect for the principle of full and permanent sovereignty of all States and peoples over their own wealth and natural resources [with due regard to the rights and interests of other States and their natural and juridical persons in accordance with international law] [as well as their inalienable right to dispose of their natural resources and of information concerning those resources].]

#### APPENDIX XIII

(U.N. Doc. A/AC.105/218 (13 April 1978), Annex III, pp. 5-8)

#### DRAFT PRINCIPLES ON REMOTE SENSING REPORTED BY WORKING GROUP III OF THE LEGAL SUBCOMMITTEE AT ITS 1978 MEETING

##### Principle I<sup>1</sup>

For the purposes of these principles with respect to remote sensing of the natural resources of the earth and its environment:<sup>2</sup>

(a) The term "remote sensing of the earth" means "remote sensing of the natural resources of the earth and its environment".<sup>3</sup>

\*(b) The term "[primary] data" means those [primary] data which are acquired by satellite-borne remote sensors and transmitted from a satellite either by telemetry in the form of electromagnetic signals or physically in any form such as photographic film or magnetic tape, as well as preprocessed products derived from those data which may be used for later analysis.

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<sup>1</sup>The question of the introduction of these definitions into the texts of the principles is to be considered later.

<sup>2</sup>The question of the application of these principles to international intergovernmental organizations will be considered later.

<sup>3</sup>The formulation "with respect to remote sensing of the natural resources of the earth and its environment" will be reviewed in light of the title to be given to the principles.

<sup>4</sup>This term is still subject to further discussion. In the view of some delegations, it would be necessary in the future work to further define the meaning of the words "remote sensing of the earth and its environment".

\* (c) The term "[analysed] information" means the end-product resulting from the analytical process performed on the [primary] data [as defined in paragraph (b) above] combined with data and/or knowledge obtained from sources other than satellite-borne remote sensors.

#### Principle II

Remote sensing of the earth from outer space and international co-operation in that field [shall] [should] be carried out for the benefit and in the interests of all countries, irrespective of their degree of economic or scientific development, and taking into consideration, in international co-operation, the particular needs of the developing countries.

#### Principle III

Remote sensing of the earth from outer space [shall] [should] be conducted in accordance with international law, including the Charter of the United Nations and the Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and other Celestial Bodies.

#### Principle IV

1. States carrying out programmes for remote sensing of the earth from outer space [should] [shall] promote international co-operation in these programmes. To this end, sensing States [should] [shall] make available to other States opportunities for participation in these programmes. Such participation should be based in each case on equitable and mutually acceptable terms due regard being paid to elements. . . .

2. In order to maximize the availability of benefits from such remote sensing data, States are encouraged to consider agreements for the establishment of shared regional facilities.

#### Principle V

Remote sensing of the earth from outer space [should] [shall] promote the protection of the natural environment of the earth. To this end States participating in remote sensing [should] [shall] identify and make available information useful for the prevention of phenomena detrimental to the natural environment of the earth.

#### Principle VI

States participating in remote sensing of the earth from outer space [should] [shall] make available technical assistance to other interested States on mutually agreed terms.

### Principle VII

1. The United Nations and the relevant agencies within the United Nations system should promote international co-operation, including technical assistance, and play a role of co-ordination in the area of remote sensing of the earth.

2. States conducting activities in the field of remote sensing of the earth [shall] [should] notify the Secretary-General thereof, in compliance with article XI of the Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and other Celestial Bodies.

### Principle VIII

Data and/or information obtained by remote sensing of the earth indicating an impending natural disaster shall be disseminated as promptly as possible to those States likely to be affected.

### Principle IX<sup>1</sup>

Taking into account the principles I and II above, remote sensing data or information derived therefrom [shall] [should] [not] be used by States [to the detriment of] [in a manner compatible with] the legitimate rights and interests of other States.

### Principle X

States participating in remote sensing of the earth either directly or through relevant international organization [shall] [should] be prepared to make available to the United Nations and other interested States, particularly the developing countries, upon their request, any relevant technical information involving possible operational systems which they are free to disclose.

### Principle XI

States [shall] [should] bear international responsibility for [national] activities of remote sensing of the earth [irrespective of whether] [where] such activities are carried out by governmental [or non-governmental] entities, and [shall] [should] [guarantee that such activities will] comply with the provisions of these principles.

### Principle XII

A sensed State [shall] [should] have timely and non-discriminatory access to data obtained by remote sensing of the earth from outer space, pertaining to its territory on

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<sup>1</sup>Should be considered in connexion with the formulation of a principle on dissemination of data or information and subject to later discussion of the terms "information" and "data."



reasonable terms [to be mutually agreed upon with the sensing State] and to the extent feasible and practicable, [shall] [should] be provided with such data on such terms [on a continuous and priority basis] [and in any case no later than any third State].<sup>2</sup>

#### Principle XIII

[Without prejudice to the principle of the freedom of exploration and use of outer space, as set forth in article I of the Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and other Celestial Bodies, remote sensing of the earth [should] [shall] be conducted with respect for the principle of full and permanent sovereignty of all States and peoples over their own wealth and natural resources [with due regard to the rights and interests of other States and their natural and juridical persons in accordance with international law] [as well as their inalienable right to dispose of their natural resources] [and of information concerning those resources].]

#### Principle XIV

[[A State which intends to conduct remote sensing of the earth from outer space shall give advance notification to the States whose territory will be sensed.] [A State [intending to conduct] [conducting] remote sensing activities of the earth from outer space shall notify the Secretary-General of the United Nations and [upon request] the States whose territory is intended to be covered by such activities [to the fullest extent feasible and as soon as practicable] of the intended launch, [nature of the] mission, duration and coverage of such activities. The Secretary-General shall publish information thus received.]]

#### Principle XV

[A State carrying out remote sensing of the earth [shall] [should] without delay consult with a State whose territory is sensed upon request of the latter in regard to such activity, [in particular dissemination of data and information,] in order to promote international co-operation, friendly relations among States and to enhance the mutual benefits to be derived from this activity.]

#### Principle XVI

[States carrying out remote sensing of the earth shall not, without the approval of the States whose territories are affected by these activities, disseminate or dispose of any data or information on the natural resources of these States to third States, international organizations, public or private entities.]

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<sup>2</sup>Subject to review in the light of the discussion on access by third States.

## Principle XVII

[Any dispute that may arise with respect to the application of these principles [shall] [should] be resolved by prompt consultations among the parties to the dispute. Where a mutually acceptable solution cannot be found by such consultations it [shall] [should] be sought through other established procedures for the peaceful means of settlement of disputes mutually agreed upon by the parties concerned.]

## APPENDIX XIV

(U.N. Doc. A/AC. 105/240 (10 April 1979), Annex I, pp. 12 and 13)

WORKING PAPERS SUBMITTED TO WORKING GROUP III OF  
THE LEGAL SUBCOMMITTEE AT ITS 1979 SESSION

Union of Soviet Socialist Republics: working paper  
(WG. III (1979)/WP. 1/Rev. 1)

## Principle XVI

1. The freedom to disseminate primary data and analysed information obtained by remote sensing of the earth shall be limited to the extent of the provisions of paragraph 2 of this article.

2. Every State is recognized to have the right to declare that certain types of primary data and analysed information obtained by remote sensing of the earth with respect to its territory may be published or given to third States or natural or juridical persons of third States only with the express consent of the State making such a declaration. The declaration may relate to primary remote-sensing data with a spatial resolution of 50 metres or finer and to analysed remote-sensing information obtained on the basis of such data. The dissemination of primary data and analysed information obtained by remote sensing of the earth with respect to the territory of a State making such a declaration may be carried out only if the conditions stated in the declaration are observed.

3. The declaration referred to in paragraph 2 shall be transmitted to the Secretary-General of the United Nations, who shall publish it for general information.

Union of Soviet Socialist Republics: working paper  
(WG. III (1979)/WP. 3)

## Principle XIV

Each State undertakes to communicate a list of States about whose territory they have received primary remote sensing data from space objects. Those States shall be

given the opportunity, under mutually acceptable conditions, to familiarize themselves with such data relating to their territory. The transfer to States of primary remote sensing data about their territory may be effected by mutual agreement between those States and the State which receives such data from space objects.

Romania: working paper  
(WG: III (1979)/WP. 6)

[This working paper was later submitted to the Sub-Committee as document A/AC. 105/C.2/L.122 and is reproduced in annex IV to its report.]

United States of America: working paper  
(WG. III (1979)/WP. 7)

#### Principle XIV

A State conducting remote sensing programmes should furnish the Secretary-General of the United Nations with information describing to the extent feasible the nature of the programme and the geographic area covered. The Secretary-General should publish information thus received. A State conducting remote sensing programmes should also furnish such information as soon as practicable directly to any State which so requests. To the extent feasible and practicable, a State which intends to conduct remote sensing programmes should give advance notification of such a programme to the Secretary-General.

Romania: working paper  
(WG. III (1979)/WP. 8)

[This working paper was later submitted to the Sub-Committee as document A/AC. 105/C. 2/L. 123 and is reproduced in annex IV to its report.]

Union of Soviet Socialist Republics: working paper  
(WG. III (1979)/WP. 9)

#### Principle I (a)-Alternative text

The term "remote sensing of the earth from outer space" means observations and measurements of energy and polarization characteristics of self-radiation and reflected radiation of elements of the land, ocean and atmosphere of the earth in different ranges of electromagnetic waves which facilitate the location, description of the nature and temporal variations of natural parameters and phenomena, natural resources of the earth, the environment as well as anthropogenic objects and formations.

Iraq: working paper  
(WG. III (1979)/WP. 11)

## Principle VIII

Data and/or information obtained by remote sensing of the earth concerning a natural disaster shall be disseminated as promptly as possible to those States affected or likely to be affected.

## APPENDIX XV

(U.N. Doc. A/AC. 105/240 (10 April 1979), Annex I, pp. 7-11)

DRAFT PRINCIPLES ON REMOTE SENSING REPORTED BY  
WORKING GROUP III OF THE LEGAL SUBCOMMITTEE AT ITS  
1979 SESSION

Principle I<sup>1</sup>

For the purpose of these principles with respect to remote sensing of the natural resources of the earth and its environment:<sup>2</sup>

(a) The term "remote sensing of the earth" means "remote sensing of the natural resources of the earth and its environment".<sup>3</sup>

(b) The term "primary data" means those primary data which are acquired by satellite-borne remote sensors and transmitted from a satellite either by telemetry in the form of electromagnetic signals or physically in any form such as photographic film or magnetic tape, as well as preprocessed products derived from those data which may be used for later analysis.

(c) The term "analysed information" means the end-product resulting from the analytical process performed on the primary data as defined in paragraph (b) above combined with data and/or knowledge obtained from sources other than satellite-borne remote sensors.

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<sup>1</sup>The content, definition and necessity of the term "analysed information" is still to be clarified.

<sup>2</sup>The question of the application of these principles to international intergovernmental organizations will be considered later.

<sup>3</sup>The formulation "with respect to remote sensing of the natural resources of the earth and its environment" will be reviewed in light of the title to be given to the principles.

<sup>4</sup>This term is still subject to further discussion. In the view of some delegations, it would be necessary in the future work to further define the meaning of the words "remote sensing of the earth and its environment".

## Principle II

Remote sensing of the earth from outer space and international co-operation in that field [shall] [should] be carried out for the benefit and in the interests of all countries, irrespective of their degree of economic or scientific development, and taking into consideration, in international cooperation, the particular needs of the developing countries.

## Principle III

Remote sensing of the earth from outer space [shall] [should] be conducted in accordance with international law, including the Charter of the United Nations and the Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies.

## Principle IV

1. States carrying out programmes for remote sensing of the earth from outer space [should] [shall] promote international cooperation in these programmes. To this end, sensing States [should] [shall] make available to other States opportunities for participation in these programmes. Such participation should be based in each case on equitable and mutually acceptable terms due regard being paid to elements. . . .

2. In order to maximize the availability of benefits from such remote sensing data, States are encouraged to consider agreements for the establishment of shared regional facilities.

## Principle V

Remote sensing of the earth from outer space [should] [shall] promote the protection of the natural environment of the earth. To this end States participating in remote sensing [should] [shall] identify and make available information useful for the prevention of phenomena detrimental to the natural environment of the earth.

## Principle VI

States participating in remote sensing of the earth from outer space [should] [shall] make available technical assistance to other interested States on mutually agreed terms.

## Principle VII

1. The United Nations and the relevant agencies within the United Nations system should promote international cooperation, including technical assistance, and play a role of co-ordination in the area of remote sensing of the earth.

2. States conducting activities in the field of remote sensing of the earth [shall] [should] notify the Secretary-General thereof, in compliance with article XI of the Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and other Celestial Bodies.

#### Principle VIII

Data and/or information obtained by remote sensing of the earth indicating an impending natural disaster shall be disseminated as promptly as possible to those States likely to be affected [all States, priority being given to those likely to be affected].

[This provision shall also apply to data and/or information obtained by remote sensing during and after natural disasters, in order to help affected States combat such disasters.]

#### Principle IX<sup>1</sup>

Taking into account the principles II and III above, remote sensing data or information derived therefrom [shall] [should] be used by States in a manner compatible with the legitimate rights and interests of other States. \*, \*\*

#### Principle X

States participating in remote sensing of the earth either directly or through relevant international organization [shall] [should] be prepared to make available to the United Nations and other interested States, particularly the developing countries, upon their request, any relevant technical information involving possible operational systems which they are free to disclose.

#### Principle XI

[States [shall] [should] bear international responsibility for [national] activities of remote sensing of the earth [irrespective of whether] [where] such activities are carried out by governmental [or non-governmental] entities, and [shall] [should] [guarantee that such activities will] comply with the provisions of these principles.]

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<sup>\*</sup>Some delegations were of the view that, for the sake of consistency it was necessary to consider this principle in the light of draft principles II and III.

<sup>\*\*</sup>A delegation reserved its position on removing the square brackets around the words "in a manner compatible with" and on the deletion of the words "not" and "to the detriment of".

<sup>1</sup>Should be considered in connexion with the formulation of a principle on dissemination of data or information and subject to later discussion of the terms "information" and "data".

## Principle XII

A sensed State [shall] [should] have timely and non-discriminatory access to data obtained by remote sensing of the earth from outer space, pertaining to its territory on reasonable terms [to be mutually agreed upon with the sensing State] and to the extent feasible and practicable, [shall] [should] be provided with such data on such terms [on a continuous and priority basis] [and in any case no later than any third State].<sup>2</sup>

## Principle XIII

[[A State which intends to conduct remote sensing of the earth from outer space shall give advance notification to the States whose territory will be sensed.] [A State [intending to conduct] [conducting] remote sensing activities of the earth from outer space shall notify the Secretary-General of the United Nations and [upon request] the States whose territory is intended to be covered by such activities [to the fullest extent feasible and as soon as practicable] of the intended launch, [nature of the] mission, duration and coverage of such activities. The Secretary-General shall publish information thus received.]]

## Principle XIV

[A State carrying out remote sensing of the earth [shall] [should] without delay consult with a State whose territory is sensed upon request of the latter in regard to such activity, [in particular dissemination of data and information,] in order to promote international cooperation, friendly relations among States and to enhance the mutual benefits to be derived from this activity.]

## Principle XV

[States carrying out remote sensing of the earth shall not, without the approval of the States whose territories are affected by these activities, disseminate or dispose of any data or information on the natural resources of these States to third States, international organizations, public or private entities.]

## Principle XVI

[Without prejudice to the principle of the freedom of exploration and use of outer space, as set forth in article I of the Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and other Celestial Bodies, remote sensing of the earth [should] [shall] be conducted with respect for the principle of full and permanent sovereignty of all States and peoples over their own wealth and natural resources [with due regard to the rights and interests of other

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<sup>2</sup>Subject to review in the light of the discussion on access by third States.

States and their natural and juridical persons in accordance with international law] [as well as their inalienable right to dispose of their natural resources] [and of information concerning those resources].]

#### Principle XVII

[Any dispute that may arise with respect to the application of [activities covered by] these principles [shall] [should] be resolved by prompt consultations among the parties to the dispute. Where a mutually acceptable solution cannot be found by such consultations it [shall] [should] be sought through other established procedures for the peaceful means of settlement of disputes mutually agreed upon by the parties concerned.]\*

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\*This principle should be reviewed in the light of the full set of agreed principles, and a decision on the legal nature of the principles.



*1. Development of the Question*

The problem of whether and how to define outer space, particularly where to draw its lower limit and thus to distinguish it from airspace, belongs, without any doubt, to the oldest and most discussed questions of the law of outer space and its doctrine.

As early as in 1932 Dr. Vladimir Mandl, an attorney from Plzen and at the same time an enthusiast for industrial and technological progress, who later became Professor of industrial law at the Czech Technical University of Prague, emphasized in the first monographical study on space law that the prospect of penetrating into outer space by means of rockets would open a new problem, not settled by air law which regulated only the legal regime of airspace; rockets in their capacity as means of transport going beyond dense layers of atmosphere would be based on quite a different principle than aircraft. Dr. Mandl held the view that the scope of the principle of the State territorial supremacy in airspace went far beyond the limits of aeronautics; this principle rather acknowledged the right of each State to retain sovereign power over any use of its superjacent air zone, be such use performed by aeronautics or in any other manner, including flights into outer space. As soon as a spacecraft enters a state's airspace, it will be subject to its jurisdiction. At the same time, Dr. Mandl made it abundantly clear that the adoption of the principle of sovereignty included only airspace, "l'espace atmospherique" in the sense of Art. 1 of the Paris Convention on Civil Aviation of 1919; there was no reason or intention to grant to States any rights reaching farther into space. Where airspace ends, the territorial supremacy, as mutually regulated by States both in treaties and in practice also ends.<sup>1</sup>

Numerous articles and attractive discussions on the issue of delimitation of outer space from airspace appeared shortly before and in the first years of space flights. During that period, it was particularly Professor John Cobb Cooper, the first Director of the Institute of Air and Space Law at McGill University in Montreal, who initiated this debate and insisted on an early solution to this problem.<sup>2</sup> He modified his views several times, but his final attitude formulated in his paper presented at the Sixth Colloquium on the Law of Outer Space of the IAF International Institute of Space Law in Paris, 1963, deserves to be quoted word by word. For Cooper urged

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\*Head of the Department on International Law and International Organization in the Institute of State and Law, Czechoslovak Academy of Sciences, Prague; Member of the Board of Directors, International Institute of Space Law; Member of the IAF International Academy of Astronautics, Section of Life Sciences.

The views expressed in this paper are those of the author and are not necessarily connected with any organization of which he is a member.

<sup>1</sup>V. Mandl, *Das Weltraum-Recht. Ein Problem der Raumfahrt* 3, 18, 31 (1932).

<sup>2</sup>Cooper, *High Altitude Flight and National Sovereignty*, *Int'l L. Q.* 411-418 (July 1951).

"a new convention which will re-affirm the complete and exclusive sovereignty of a subjacent State up to the height to which normal types of aircraft may be operated, then an agreed extension of sovereignty up to the height at which an artificial satellite may be put in orbit around the earth, such convention providing, however, for the passage of peaceful spacecraft through the extended area when ascending toward or descending from free outer space above".

In specific terms he recommended a convention providing

"complete and exclusive sovereignty of the subjacent State up to 20 or 25 miles above the earth's surface; then it would authorize the extension of national sovereignty up to 70 or 75 miles, with rights of passage for peaceful spacecraft through this extended area; . . . outer space beyond be free and not subject to national appropriation".<sup>3</sup>

In a similar spirit, Professor Cooper reaffirmed this position in one of his last articles dealing with the subject in which he wrote:

"General agreement appears to exist that the upper boundary of national airspace is not below the upper limit of practical flight of aircraft requiring aerodynamic lift and using air breathing engines. This limit may be approximately 25 miles above sea level. Also, agreement seems to exist that an international rule of customary law is now effective which prevents any State from claiming sovereign territorial control in areas where orbital flight of artificial earth satellites is practical. This limit has been estimated at between 75 and 90 miles above the surface of the earth at sea level. It would appear, therefore, that there is now practical agreement that the upper level of national airspace is not less than approximately 25 miles above the earth's surface and not more than 90 miles. This question must finally be settled if the future use of 'outer space' beyond the 'airspace' is to be protected for the benefit of all States".

At the same time, however, Cooper admitted that "Certainly many States may still be unwilling to commit themselves as to a definite upper boundary of national airspace territory for military or other reasons".<sup>4</sup>

Since 1957, the need for and possibility of a delimitation between airspace and outer space was also defended by Andrew G. Haley, the then General Counsel of the International Astronautical Federation, who elaborated his point of view on a doctrine of Dr. Theodor von Karman, an outstanding expert in the field of aerodynamics and theory of space flight. According to Haley

"there are two borderlines for continuous flight with aerodynamic lift—the heat barrier, which determines the maximum velocity, and the altitude barrier, which is ratio between lift and Kepler force. Between these two barriers there is a corridor of continuous flight which terminates when at [the] approximate speed of 25,000 feet per second and an altitude of about 275,000 feet the Kepler force takes over and

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<sup>3</sup>Cooper, *The Upper Airspace Boundary Question*, Proc. Sixth Colloquium on the Law of Outer Space 6 (1963).

<sup>4</sup>Cooper, *Background of International Public Air Law*, 46 Yb. Air & Space L. 26-27 (1965).

aerodynamic lift is gone. This is a critical jurisdictional line, marking the theoretical limit of air flight, which is here termed the von Kármán line. . . . The von Kármán primary jurisdictional line may eventually remain as presented above or, as a result of such developments as improved techniques of cooling and more heat-resistant materials, it may be significantly changed. But these changes will be only in the exact location of the von Kármán line, for the existence of the line is certain, and wherever it is finally drawn will be the place where 'airspace' terminates.'"<sup>5</sup>

A third example of early suggestions in the doctrine of space law concerning the definition and delimitation of outer space is embodied in the Draft Code and Rules of the David Davies Memorial Institute of International Studies of 1962. They were worked out by a Study Group headed by Professor R.Y. Jennings of Cambridge University. In this remarkable document, "airspace" was defined as the volume of space between the surface of the Earth at sea level and an altitude of 80,000 meters above it, while "outer space" was defined as space outside the airspace. In the commentary to these definitions it was recognized that at that time the lower effective limit of perigee was in the region of the altitude of 100 miles, since below that the life of the satellite was too short to be useful, and it was possible that an altitude of about 70 miles would be the limit for effective orbiting, inasmuch as below that, friction would become too great. In this document it was also confirmed that 25 miles was probably the outside limit of effective aerodynamic lift. However, three considerations were recalled, which favored a definition of airspace yielding a more extended sovereignty than 25 miles: (1) the fact that airspace begins to lose its character as a continuous medium only when a height of 50-55 miles is reached; (2) the likely range of effective control of objects from the ground; and (3) the logic of treating the frontier between airspace or outer space as being at or near orbiting altitude. In their final sentence the authors of this document admitted that any particular altitude chosen as the limit of sovereignty over the airspace might appear arbitrary and be controversial; but, for the avoidance of excessive claims and in view of the aforementioned considerations, the relatively low altitude of about 50 miles was suggested as the limit of sovereignty and the beginning of outer space.<sup>6</sup>

Not much later than the first suggestions concerning the delimitation between airspace and outer space, the first contributions opposing the idea of demarcation as well as the need to draw any limit of this kind also appeared. The sponsors of this position, which was soon called "functional approach", recommended regulation of different types of activities to be developed in space without any borderline between its different parts. The origin of this approach is usually attributed to two US scholars—Professor Myres S. McDougal and Leon Lipson,<sup>7</sup> but it was also elaborated by Professors R. Quadri

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<sup>5</sup>A. Haley, *Space Law and Government* 98-99 (1963).

<sup>6</sup>Draft Code and Rules of the David Davies Memorial Institute of International Studies, *Draft Code of Rules on the Exploration and Uses of Outer Space* in W. C. Jenks, *Space Law*, App. X, 419-421 (1965).

<sup>7</sup>McDougal and Lipson, *Perspectives for a Law of Outer Space*, 52 *Am. J. Int'l L.* 407 (1958).

of Italy and Ch. Chaumont of France<sup>8</sup>. Such position found able supporters among some lawyers from the Socialist countries too, particularly in the writings of Dr. Gyula Gál of Hungary who emphasized in his book on space law that

"In accordance with the above conception of the functional character of space law, the new legal domain, other than all earlier norms of human conduct, cannot be associated with any limited space (area, zone), but only with the character of activity under regulation. . . . Its recognition is a logical necessity following from the various aspects of space law. It can be said that, though there are various contradictions in the relevant positive law fundamentals, this theory has been borne out during the legal progress of the past few years".<sup>9</sup>

Since 1959, the subject of delimitation was already listed among possible topics of the emerging space legislation to be considered by the *Ad Hoc* Committee on the Peaceful Uses of Outer Space. In its report, however, this Committee expressed the following view: "it was generally believed that the determination of precise limits for airspace and outer space did not present a legal problem calling for priority consideration at this moment".<sup>10</sup>

The present Committee on the Peaceful Uses of outer Space, which effectively started the space treaty-making process in 1961, maintained, at least in the first stage of its negotiation, a similar position as had been held by its *Ad Hoc* predecessor. For several succeeding years this UN body left the question of defining outer space completely aside when it considered the first draft agreements to govern the fast developing space activities.

It must, however, be recalled that only a few years later, in its Resolution 2222/XXI of December 19, 1966, by which the Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, Including the Moon and Other Celestial Bodies was commended for signature and ratification by States, the UN General Assembly requested the UN Committee on Outer Space "to begin at the same time the study of [the] question relative to the definition of outer space and the utilization of outer space and celestial bodies. . .".<sup>11</sup> And indeed, this request was complied with in the ensuing work of the UN Committee and both of its Subcommittees.

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<sup>8</sup>Quadri, *Droit international cosmique*, 98 *Recueil des Cours* 505 (1959); Chaumont, *Les perspectives que doit adopter le droit de l'espace*, 7 *Revue de droit contemporain* 5 (1960).

<sup>9</sup>G. Gal., *Space Law* 106-107 (1969).

<sup>10</sup>Report of the *Ad Hoc* Committee on the Peaceful Uses of Outer Space, U.N. Doc. A/4141 at 93-94 (1959).

<sup>11</sup>21 U.N. GAOR, Supp. 16, at 13, U.N. Doc. A/6316 (1966).

The Legal Subcommittee discussed the question in greater detail at its following session in 1967. Consideration of the question led to divergent opinions, but it may be said in general that more or less reluctant views were held. As a matter of fact, the only positive result of this discussion was a Questionnaire addressed to the Scientific and Technical Subcommittee, inviting this body "to draw up a list of scientific criteria that could be helpful to the Legal Sub-Committee in its study relative to a definition of outer space". Furthermore, the Scientific and Technical Subcommittee was called upon to "give its views on the selection of scientific and technical criteria that might be adopted by the Legal Subcommittee, and to indicate, on scientific and technical grounds, the advantages and disadvantages of each of them in relation to the possibility of a definition which would be valid for the long-term future. . ."<sup>12</sup>.

This way of approaching the question of defining outer space—which was after all a problem of a legal nature—must have proved to be ineffective. Indeed, after an exchange of views on this topic, the Scientific and Technical Subcommittee agreed on a position that read as follows: ". . . it is not possible at the present time to identify scientific or technical criteria which would permit a precise and lasting definition of outer space. . ."<sup>13</sup>. Nevertheless, the Subcommittee felt it appropriate to continue its work in this field.

For several subsequent years, this point remained on the agenda of the Legal Subcommittee, but a thorough consideration of all aspects involved was repeatedly postponed. As it was recorded in one of the Subcommittee reports of this period on this item, "owing to lack of time, it had not been considered in any detail",<sup>14</sup> despite the fact that—as recorded in another report—"a number of useful statements were made by delegations in which they stressed the renewed importance of the subject and expressed the wish that it should receive more detailed examination at future meetings."<sup>15</sup>

It should be recalled, however, that in 1970 the Legal Subcommittee initiated the preparation by the UN Secretariat of a background paper on the question. Such document was to take into account "both the data provided by the study carried out by the Legal Subcommittee and the Scientific and Technical Subcommittee, and also the contributions, studies, data and documents which may be obtained from the specialized

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<sup>12</sup>Report of the Legal Subcommittee on the Work of Its Sixth Session, June 19-July 14, 1967, U.N. Doc. A/AC. 105/37, at 8 (1967).

<sup>13</sup>22 U.N. GAOR, Annexes, Agenda Item No. 32 at para. 36, U.N. Doc. A/6804 (1967).

<sup>14</sup>Report of the Legal Subcommittee on the Work of its Sixteenth Session, March 14-April 8, 1977, U.N. Doc. A/AC.105/196, at 9 (1977).

<sup>15</sup>Report of the Legal Subcommittee on the Work of its Fifteenth Session, May 3-29, 1976, U.N. Doc. A/AC. 105/171 (1976), at 8.

agencies concerned and such other international and national organizations and institutions which are interested in the subject as may be determined by the Committee on the Peaceful Uses of Outer Space".<sup>16</sup> Indeed this paper, called *The Question of the Definition and/or the Delimitation of Outer Space*,<sup>17</sup> later on completed by an Addendum,<sup>18</sup> has offered an excellent review of opinions expressed on the problem both in intergovernmental and nongovernmental bodies and included a comprehensive analysis of all aspects involved.

In this connection, it should also be remembered that among the nongovernmental organizations, it was the International Academy of Astronautics (IAA) and the International Institute of Space Law (IISL), both of them permanent institutions of the International Astronautical Federation, which favorably responded to the need of studying both the scientific and legal aspects of the problem. The Scientific-Legal Liaison Committee, a joint body of the IAA and the IISL, discussed different aspects of the definition of outer space at two of its meetings, held respectively at the Belgrade and New York Congresses of the IAF in 1967 and 1968.<sup>19</sup>

Nevertheless, it was not until the recent period in the work of the UN Legal Subcommittee that new interest in a thorough consideration of the problem appeared. In our opinion, this development was stimulated by several factors of a completely different nature.

The first of these factors might be characterized as an inevitable consequence of the growth of space legislation which completed up to 1975 four international treaties of universal interest, governing different kinds of space activities. When applying the space legal instruments, in which such terms as "outer space", "space objects", "space activities" etc., are repeatedly used, States, both performing and not performing space activities, cannot live forever without knowledge of the proper meaning of outer space in precise legal terms and, particularly, of its exact beginning. For the notion of space activities itself can be defined only on the basis of the definition of outer space.<sup>20</sup> Of course, this factor alone, being of an intrinsic quality, would hardly be sufficient to reverse the general reluctance of giving an answer to the question which has survived for decades.

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<sup>16</sup>U.N. GAOR, Twenty-fourth Session, Supp. 21, Annex III, para. 13B, U.N. Doc. A/7621 (1969).

<sup>17</sup>U.N. Doc. A/AC. 105/C. 2/7 (1970).

<sup>18</sup>U.N. Doc. A/AC. 105/C. 2/7/Add. 1 (1977).

<sup>19</sup>See Proc. Tenth Colloquium on the Law of Outer Space 267-279 (1969); Proc., Eleventh Colloquium on the Law of Outer Space 371-395 (1968).

<sup>20</sup>A. Piradov (ed.) *Mezhdunarodnoe Kosmicheskoye pravo* 5 (1974).

In addition, however, other factors have emerged or become more impending in recent years. One of these was the ever-growing number of space objects launched into orbits around the earth and beyond them, as well as the prospect of establishing large orbiting space systems of a multipurpose character in the near future. Moreover, a new generation of space vehicles, such as the Space Shuttle, has recently initiated a study of all problems involved, including the scope of application of space law agreements to different phases of the flight of such aerospace transport vehicles.

Furthermore, the prospects of establishing solar power satellites collecting energy in outer space, converting such energy to microwave beams and transmitting it from satellites to earth<sup>21</sup>, also raised the question of defining outer space in the particular context. For such beams will have to pass not only through the international area of outer space, governed by the principle of freedom of exploration and peaceful use of outer space for all nations but also through the zone of airspace, with due respect for the principle of complete and exclusive sovereignty of subjacent States over their relevant zones.<sup>22</sup>

Without any doubt, a strong impetus to a renewed consideration of the problem of defining outer space was also given by another issue which has recently emerged on the international level, namely, the legal status of the geostationary orbit. This issue appeared in connection with claims of a group of countries to the parts of the geostationary orbit superjacent to their national territory. As we know, such claims were advanced particularly in the Bogota Declaration of 1976, signed by eight equatorial countries and published on the eve of the International Telecommunication Union's World Administrative Radio Conference for Broadcasting Satellite which was convened for January 1977 to Geneva. They were also brought before the UN Committee on Outer Space and its Legal Subcommittee.<sup>23</sup>

As a result, the UN General Assembly, in its Resolution 196/XXXII of December 20, 1977, amplified the original wording of the item, by introducing a new formula spelled out as "Questions relating to the definition and/or delimitation of outer space and outer space activities, also bearing in mind questions relating to the geostationary orbit". It was in this manner that the question of defining outer space received its present shape which now deserves, without any doubt, new attention and careful consideration by the world community of space lawyers.

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<sup>21</sup>Gorove, *Legal Aspects of Solar Power Satellites: Focus on Microwave Exposure Standards*, Paper submitted to the Twenty-Second Colloquium on the Law of Outer Space of the International Institute of Space Law, Munich, Germany, at 1 (1979).

<sup>22</sup>Haanappel, *Definition of Outer Space and Outer Space Activities*, Proc. Twentieth Colloquium on the Law of Outer Space 53 (1977).

<sup>23</sup>Report of the Comm. on the Peaceful Uses of Outer Space, U.N. GAOR, 33rd Sess., Supp. 20 at 10, para. 40, U.N. Doc. A/33/20 (1978); Report of the Legal Subcomm. on the Work of Its Seventeenth Session, March 13-April 7, 1978, at 10, para. 40, U.N. Doc. A/AC.105/218 (1978).

## II. *Analysis of Some Aspects of the Question*

### a) *Space Law Instruments and the Definition of Outer Space*

Does present space legislation require an exact answer to the question of where outer space begins? Do the up-to-date space agreements provide a satisfactory basis for such definition? It is our conviction that both questions may be answered affirmatively.

In the first place, such conclusion may be drawn from the main space law instrument, namely the Space Treaty of 1967. Certainly, most of its provisions have been spelled out as principles governing space activities as performed from their very outset until the end rather than as provisions bolstering the legal status of outer space as such. Nevertheless, there are some other important provisions in the Space Treaty, the realm of which requires a clear idea about what is to be considered as outer space for the purposes of cosmonautics and where it begins, with all legal consequences resulting from such determination. The gist of this category of provisions lies in Article I of the Space Treaty in which the fundamental principle of freedom of exploration and use of outer space, including the moon and other celestial bodies, by all States has been incorporated. In a similar way, the principle of nonappropriation of outer space, as included in Article II of the Treaty, requires the same kind of delimitation of its scope. While outer space is governed by the common interests of all nations and shall remain free, the lower part of space superjacent to the territory of any State is subject to the latter's complete and exclusive sovereignty. Both fundamental provisions bear clearly a territorial character and cannot be correctly interpreted and applied without a precise delimitation of the two legally different spaces.

As might be expected, other principles of the Space Treaty also require a precise definition of outer space, since any violation of them by acts occurring in outer space would be connected with some legal consequences. Thus according to Article VI, States Parties to the Space Treaty shall bear international responsibility for national activities in outer space and for assuring that such activities are carried out in conformity with the provisions of the Treaty. According to Article IX, States Parties to the Treaty shall pursue studies of outer space, including the moon and other celestial bodies, and conduct exploration of them so as to avoid their harmful contamination. They are obliged to undertake, and also entitled to request, appropriate international consultations if they have reason to believe that a space activity or experiment in outer space would cause potentially harmful interference with activities of other States Parties in the peaceful exploration and use of outer space.

As another example, Article VIII of the Space Treaty might be recalled. According to its provision a State Party to the Treaty on whose registry an object launched into outer space is carried shall retain jurisdiction and control over such object and over any personnel thereof while in outer space or on a celestial body. Moreover, ownership of objects launched into outer space, including objects landed or constructed on a celestial body and their component parts, shall not be affected by their presence in outer space or



on a celestial body or by their return to the earth. Similarly as it has been in the case of freedom and nonappropriation of outer space, jurisdiction and control over space objects and the personnel thereof, as well as ownership of such objects and of their component parts are purely legal concepts requiring an exact definition of their meaning and application by means of a definition of outer space. For without such definition it could not be established whether and at which moment the State exercising its jurisdiction and control over a space object and the personnel thereof had to take into account that the object concerned entered the part of space in which the sovereignty of another State would apply.

The legal regime of outer space, being the proper theatre of space activities, widely differs from that of airspace in which aeronautics develop. It was just this difference that led the earlier proponents of a solution to this problem to emphasize the need of an agreement on a dividing line between the two parts of space. This may be illustrated by the view of Professor Alex Meyer of the University of Köln am Rhein (Federal Republic of Germany) who stated in his contribution to the First UN Conference on the Exploration and Peaceful Uses of Outer Space in Vienna, 1968, the following:

"... it seems to be beyond any doubt that the States will not and cannot renounce the sovereignty over the air space above their land and water territories constituting a part of their sovereign territory. But if it is true, the fixation of a limit between air space and outer space will become a necessity, for only in this way can it be stated that an act of legal relevance, if it happened, did take place in the air space or in outer space. This statement is again necessary because, apart from international rules agreed upon, in the air space above the territories of the States—which is, as mentioned, subject to their sovereignty—the laws of the subjacent State are applicable, whereas in the free outer space acts of legal relevance on board space craft have to be judged according to the rules of the State of which the space craft has the nationality".<sup>24</sup>

On the other hand, it must be recognized that there are two other space law instruments dealing with special aspects of space activities, namely, the Agreement on the Rescue of Astronauts, the Return of Astronauts and the Return of Objects Launched into Outer Space of 1968 and the Convention on International Liability for Damage Caused by Space Objects of 1972. None of these treaties has stressed the need for defining outer space. The whole construction of the Liability Convention has been erected on the difference between the application of absolute liability to pay compensation for damage caused by space objects on the surface of the earth or to aircraft in flight, and the application of liability based on fault for damage caused elsewhere than on the surface of the earth to a space object or to persons or property on board such an object by a space object of another launching State. Nevertheless, the concept of outer space has penetrated in this Convention too, at least in an indirect way. For the term "space object" has to be interpreted and it will hardly be possible to do so without an exact content of the meaning of outer space.

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<sup>24</sup>A. Meyer, Legal Problems of Outer Space, in Vol. II. Space Explorations and Applications, Vienna, 14-27 August, 1968, at p. 1135 (United Nations, N.Y., 1969).

However, the fourth space law instrument, the Convention on the Registration of Objects Launched into Outer Space of 1975<sup>25</sup> has again pushed to the foreground the question of defining outer space, suggesting simultaneously an important criterion to be taken as the basis for a solution to this issue. According to Article II of this Convention the launching State is obliged to register its respective space object by means of an entry in an appropriate registry which it shall maintain, "when a space object is launched into orbit or beyond".<sup>26</sup> A similar, though less apparent approach has been applied in Article IV of the same Convention. In this provision States of registry, on the basis of practice recommended by the General Assembly Resolution 1721/XVI of 1961, assumed the obligation to furnish to the Secretary-General of the United Nations information on space objects carried on their registries. Such information must include basic orbital parameters, such as nodal period, apogee and perigee, of each object concerned.

In fact, the drafters of the Registration Convention applied the same criterion that had already been used by the designers of the 1967 Space Treaty in its Article IV dealing with the denuclearization of outer space. By this provision, in which an earlier commitment expressed in the General Assembly Resolution 1884/XVIII of October 17, 1963 was incorporated, States Parties to the Treaty have undertaken not to place in orbit around the earth any objects carrying nuclear weapons or any other kinds of weapons of mass destruction, not to install such weapons on celestial bodies or to station such weapons in outer space in any other manner.

As to the next space law documents the Draft Agreement Governing the Activities of States on the Moon and Other Celestial Bodies, as completed at the 1979 session of the UN Committee on Outer Space,<sup>27</sup> does not raise urgent questions with regard to the item of definition and/or delimitation of outer space. For its main aim is to regulate the exploration and use of the moon and other celestial bodies which lie, without any doubt, in outer space. On the other hand, two draft sets of principles which are still under discussion on remote sensing and on direct television broadcasting, use the terms of outer space and satellites ("remote sensing of the earth from outer space and international co-operation in that field"<sup>28</sup> and "activities in the field of international direct television broadcasting by means of artificial earth satellites").<sup>29</sup> In this way the definition of outer space, and particularly the element of satellite orbits, will again be invoked as it was in the case of the Registration Convention.

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<sup>25</sup>Convention on Registration of Objects Launched into Outer Space, March 29, 1972, [1973] 24 U.S.T. 2389, T.I.A.S. 7762 (effective Oct. 9, 1973).

<sup>26</sup>*Ibid.*

<sup>27</sup>*Cf.* Report of the Committee on the Peaceful Uses of Outer Space, General Assembly Official Records, Thirty-Fourth Session, Supplement No. 20 (A/34/20) Annex II, 33 (1979).

<sup>28</sup>*Cf.* Principle II in Texts of Draft Principles on remote sensing, U.N. Doc. A/AC.105/240 of April 10, 1979, Annex I, 8.

<sup>29</sup>*Cf.* Purposes and Objectives in Texts of Draft Principles on direct television broadcasting, U.N. Doc. A/AC.105/240 of April 10, 1979, Annex II, 9.

Therefore, it may be stated that at least in some principles and specific provisions of the relevant legal instruments, the criterion of orbits of earth satellites has already been applied, thus indicating a realistic and practical basis for a viable solution to the question of defining outer space. For all objects launched into orbit around the earth and beyond must be, without any hesitation, qualified as space objects, *i.e.*, objects accomplishing missions in outer space.

*b) Definition of Outer Space and New Generation of Space Vehicles*

The question of defining outer space has to be studied not only as a problem of the growth of space law on the basis of legal principles and rules as such, but also with due regard to new trends in the technology of space flights. Without any doubt, new generations of space vehicles will increase the present number of questions involved, adding further aspects to the existing issues and also raising some completely fresh points. The appearance of new types of space vehicle, as demonstrated by the Space Shuttle, offers an outstanding example of this development.

As we know, the Space Shuttle has to be launched as a spacecraft by means of rocket propulsion, but it will return to earth through airspace as a glider. This fact has inevitably brought up the question of whether the Shuttle, though obviously a space object during the initial stage of its flight and when fulfilling its space mission, may still be considered a space object when it derives in the final stage of its flight "support in the atmosphere from the reactions of the air", in the sense of the definition of aircraft as provided in Annex 7 to the Chicago Convention on International Civil Aviation of 1944.<sup>30</sup> Consequently, this double character of the Space Shuttle has been considered by some observers as a new major factor contributing to the practical significance of an agreement on a boundary between airspace and outer space.<sup>31</sup>

On the other hand, opponents of a conventional definition of outer space usually argue that the Space Shuttle will be registered as any other space object under the 1975 Convention on the Registration of Objects Launched into Outer Space and not as an aircraft under the 1944 Chicago Convention on Civil Aviation and the relevant law of an individual State governing aeronautics. Moreover, little difference is observed between the present space objects and the Space Shuttle from the point of view of descent profiles, since the Shuttle, too, "is operationally constrained to land at a pre-planned landing field".<sup>32</sup> Even if it is admitted that activities of the Space Shuttle should be

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<sup>30</sup>Chicago Convention on International Civil Aviation, Annex 7 (1944).

<sup>31</sup>Haanappel, *Airspace, Outer Space and Mesospace*, Proc. Nineteenth Colloquium on the Law of Outer Space 160 (1976).

<sup>32</sup>Menter, *Relationship of Air & Space Law*, Proc. Nineteenth Colloquium on the Law of Outer Space 166, 168 (1976). In this article reference is made to a letter of M.S. Malkin, Director of the Space Shuttle Program, NASA, addressed to M. Menter.

conducted "with due regard for the safety of other users of the airspace or for the safety of persons and property on the ground," it is still affirmed that this aim could be reached without defining the Shuttle as an aircraft. Thus, the whole character of the Space Shuttle is based on its purpose, "to engage in *space transportation rather than air transportation* as well as to engage in *space flight rather than aviation*. It is because of this that the "spacecraft nature" of the Shuttle predominates over its "aircraft nature".<sup>33</sup> The conclusion derived from this type of argument is that the appearance of the Space Shuttle has not in any way reinforced the need for the establishment of a delimitation between the two parts of space.

It should be noted, however, that notwithstanding that the Space Shuttle may be qualified as a space object for the purposes of registration, such qualification cannot change the fact that the Shuttle will move in two parts of space governed respectively by two different legal regimes. Consequently when considering practical questions of the co-existence of this type of space vehicle with other flying machines in the stage of traversing airspace, one cannot overlook the fact that it will move in this part of space in a similar way as other gliders, the only difference consisting in the origin and purposes of their flights.

Therefore the decisive question does not depend on whether the Space Shuttle in the descent stage of its flight shall be considered an aircraft or a spacecraft. When it enters that part of space which, if superjacent to the territory of a State, is subject to its complete and exclusive sovereignty, the Space Shuttle, too, as any other space object, has to observe the territorial supremacy of the State concerned including its national jurisdiction. The basic question, namely, at which moment of the flight such situation occurs, will always be valid and this question cannot be answered without a precise knowledge of the exact position of the boundary between airspace and outer space. Also sea vessels, when they navigate on the high seas, use the freedoms of the sea but when they enter the territorial sea of a State, they have to respect fully the sovereignty of the coastal State which extends beyond its land territory and internal waters up to the outer limit of the territorial sea. In a similar way, a space object of any kind, be it a traditional space object or a reusable aerospace vehicle, will be subject to the legal regime of outer space when in orbit. However, such object must observe the principle of sovereignty and acknowledge all legal consequences thereof when passing through the territorial airspace of a subjacent State.

Of course, it may be expected that trajectories of the Space Shuttle will be planned in such a way that besides the free part of airspace above the high seas they enter only the national airspace of the launching State. At the same time, however, eventualities of an unplanned landing should be taken into account. Moreover, it should be considered

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<sup>33</sup>Sloup, *Why the NASA Space Shuttle Will Not Require a Specific Altitude to be Chosen As the Legal Boundary Between Air Space and Outer Space*, Proc. Twentieth Colloquium on the Law of Outer Space 57 (1977).

that future aerospace vehicles may possess increased aerodynamic capability allowing them "to land and take off from any large and properly equipped airport on the planet".<sup>34</sup> The impact of a new generation of space vehicles cannot be studied only in the light of its first representative but also with due regard to other prospective types of aerospace transport vehicles.

Finally, the participation of other nations with less advantageous geographical positions, not allowing them to manage the flights of aerospace vehicles without violating some part of airspace subject to sovereignty of another State, should also be taken into consideration.

The only reasonable conclusion that might be derived from such situations would be a general recognition of the right of innocent passage through airspace above the territories of other States as and when necessary for the taking off and landing of a space vehicle, be it for purposes of a regular flight mission or when the vehicle concerned experiences emergency conditions. Such a solution would be primarily based on a analogy with the right of innocent passage through the territorial sea which must not be prejudicial to the peace, good order or security of the coastal State concerned and shall take place in conformity with relevant provisions of the law of the sea and other rules of international law. At the same time, however, we cannot neglect the differences existing between principles and other provisions of the law of the sea and the law governing space.

Moreover, it is possible to draw a certain analogy between the right of innocent passage through airspace and the right of access to and from the sea that is generally recognized in favor of the land-locked countries. Otherwise only a limited number of States would be in a position to use independently the freedom of outer space, while others might be in fact deprived of the right to explore and use outer space on an equal basis.

#### *c) Issue of Geostationary Orbit and Definition of Outer Space*

As already mentioned, the legal problem of defining outer space has been recently contaminated by another issue, namely the legal status of geostationary orbit. In contravention of para. 2 of Article I of the Space Treaty, which states that "outer space, including the moon and other celestial bodies, shall be free for exploration and use by all States, without discrimination of any kind, on a basis of equality and in accordance with international law", claims have been advanced to rights of sovereignty over certain segments of the geostationary orbit in favor of individual States located below such

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<sup>34</sup>Sloup, *The Relationship of Air Law and Space Law—A View From the Space Shuttle, Including Its Internal and External Environments*, Proc. Nineteenth Colloquium on the Law of Outer Space 210 (1976).

segments. The first statements of this kind were made as early as 1975 and 1976.<sup>35</sup> A group of equatorial States extended a similar position in a Declaration adopted at the meeting held in Bogota from 29 November to 4 December 1976.<sup>36</sup> It is evident that this document was drafted in connection with the World Administrative Radio Conference for the Planning of the Broadcasting Satellite Service in specific frequency bands, held in Geneva, 1977. Such claims were also presented and discussed in greater detail on the forum of the UN Committee on Outer Space and its Legal Subcommittee, particularly in 1977 and 1978.<sup>37</sup>

The advocates of claims of sovereignty endorsed them by different arguments, some of them even contradicting each other. In principle, however, their position was mostly based on the assumption that "the geostationary orbit, both because of its physical characteristics and technical attributes, but also because of the existing legal regulations, constitutes a limited natural resource over which the equatorial countries exercise sovereign rights in accordance with international law".<sup>38</sup> They also shared the opinion that

"the provisions of international law which affirm the right of peoples and nations freely to exercise full and permanent sovereignty, including possession, use and disposition, over all their natural wealth and resources are applicable and justify the exercise of sovereignty over the segments of the geostationary orbit corresponding to their national territory".<sup>39</sup>

The delegations of the equatorial States in the UN Legal Subcommittee also maintained the viewpoint that "the geostationary orbit must be used in priority for the benefit of the developing countries in order to help to narrow the gap between the developing countries and the industrialized countries on an equitable basis."<sup>40</sup> Finally,

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<sup>35</sup>*Cf.* statement made on 14 October 1975 by the delegate of Colombia in the First Committee of the U.N. General Assembly at its Thirtieth Session, U.N. Doc. A/C.1/PV.2052 at 43; statement of the delegate of Colombia made on 20 October 1976 in the First Committee of the U.N. General Assembly at its Thirty-First Session, U.N. Doc. A/C.1/31/PV.8 at 7. and statement of the delegate of Ecuador made on October 21, 1976 at the same forum, U.N. Doc. A/C.1/31/PV.10 at 36.

<sup>36</sup>Declaration of the First Meeting of Equatorial Countries (the so-called Bogota Declaration) was signed on December 3, 1976 by Colombia, Congo, Ecuador, Indonesia, Kenya, Uganda, Zaire and also by Brazil in the capacity of observer. For a text, see 6 J. Space L. 193 (1978). For a more detailed analysis of this document, *cf.* Finch, *The Geostationary Orbit and 1967 Outer Space Treaty*, Proc. Twentieth Colloquium on the Law of Outer Space 219 (1979).

<sup>37</sup>*Cf.* Gorbien, *Un nouveau probleme du droit cosmique international*, 13 *Revue roumaine d'etudes internationales* 253 (2/44; 1979).

<sup>38</sup>*Cf.* Report of the Legal Subcommittee on the Work of Its Seventeenth Session (13 March-7 April 1978), U.N. Doc. A/AC.105/218 of April 13, 1978 at 10. para. 40 (1978).

<sup>39</sup>*Ibid.*

<sup>40</sup>*Ibid.*

it must be recalled in the framework of this study that among arguments intended to endorse the sovereignty claims to segments of the geostationary orbit the lack of any satisfactory definition of outer space in the 1967 Space Treaty and other space law instruments was invoked, leaving reportedly to individual States to establish limits in the relevant parts of space by their own decision. Moreover, the equatorial countries stressed that with regard to the unique and specific nature of the geostationary orbit, "its *sui generis* character should be taken into account in any definition of outer space whose limits have not yet been established."<sup>41</sup>

As we know, representatives of other nations, including the socialist countries were resolutely opposed to such sovereignty claims and made this position abundantly clear both at the Geneva Conference of 1977 and in the United Nations. On several occasions, they emphasized that the geostationary orbit was an inseparable part of outer space, as a matter of fact the most important one in many aspects of the practical uses of present and future space technology. Like outer space as a whole, the geostationary orbit shall not be subject to any kind of national appropriation. As a part of outer space the geostationary orbit should be considered as the province of mankind, *i.e.*, it should be used for the benefit and in the interests of all countries, irrespective of the degree of their economic or scientific development and also irrespective of their geographical location. These and other reasons were advanced in the Working Paper submitted by the USSR to the UN Committee on Outer Space at its twentieth session in 1977, which contained considerations on the legal status of the geostationary orbit.<sup>42</sup> It should be also recalled in this connection that several analytical articles on this issue appeared in recent legal literature.<sup>43</sup>

The problem of the geostationary orbit must be definitely approached in quite another manner than in terms of national appropriation of its parts by individual countries, be it by claims of sovereignty or in fact by exclusive uses of the positions concerned and saturation of the geostationary orbit by a few nations. Both these ways

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<sup>41</sup>*Ibid.*

<sup>42</sup>Report of the Legal Subcommittee on the Work of Its Seventeenth Session, U.N. Doc. A/AC.105/L.94 at 10, para. 36 (1977); Report of the Committee on the Peaceful Uses of Outer Space, General Assembly Official Records, Thirty-Second Session, Supplement No. 20 (A/32/20), 1977, Annex VI on p. 29; Report of the Legal Subcomm. on the Work of Its Eighteenth Session, Mar. 12-Apr. 6, 1979, U.N. Doc. A/AC.105/240 at 9, 44, 47 (1979).

<sup>43</sup>*Cf.* Busak, The Geostationary Satellite Orbit—International Cooperation or National Sovereignty?, 45 Telecommunications J. 167 (1978); K. Wiewiorowska, Legal and Political Problems of the Geostationary Orbit, Proc. Twenty-First Colloquium on the Law of Outer Space 34 (1979); Christol, The Geostationary Orbit Position as a Natural Resource of the Space Environment, 26 Netherlands Int'l L. Rev. 5 (1979); Gorove, The Geostationary Orbit: Issues of Law and Policy, 73 Am. J. Int'l L. 443 (1979).

would lead to discrimination against nations of the present world even though they are all entitled to explore and use outer space as "the province of all mankind."<sup>44</sup>

On the contrary, the proper way to solve the problem would be to consider how to use this highly important part of outer space in the most rational and efficient way for the benefit of all countries, both those situated below this part of space and those located at other parts of our planet. A proper approach should also lead us to consider how to ensure equal rights to an effective participation in the utilization of the geostationary orbit for all nations interested in such activities, without creating obstacles to further useful developments of space exploration while serving the common interests of all mankind.

Definitely, the proper way to a settlement of this particular and fairly complex issue cannot be found in a division of outer space and in an isolation of its specific part that would be subject to completely different legal rules, neglecting and even opposing the fundamental principles of the space law in force as codified in the 1967 Space Treaty. On the contrary, on the basis of the general principles governing the exploration and peaceful uses of outer space as a whole, *i.e.*, under the general scope of the Space Treaty, some more specific rules regulating the uses of the geostationary satellite orbits could be developed, thus creating a special regime for this important but inseparable part of outer space within the general legal regime thereof.

As a matter of fact, despite the adoption of a somewhat misleading qualification of the geostationary orbit in Article 33 of the International Telecommunication Convention of 1973 (Malaga-Torremolinos) and other related documents<sup>45</sup>, this method has already been applied in some practical measures by the ITU. Their purpose is to regulate "the best possible use of the radio-frequency spectrum and the

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<sup>44</sup>Art. I of the Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, Including the Moon and Other Celestial Bodies (hereinafter "Space Treaty"), Jan. 27, 1967, [1967] 18 U.S.T. 2410, T.I.A.S. No. 6347.

<sup>45</sup>*Cf.* Article 33 of the new version of the Convention entitled "Rational use of the radio frequency spectrum and of the geostationary satellite orbit" which specifies: "In using frequency bands for space radio services Members shall bear in mind that radio frequencies and the geostationary satellite orbit are limited natural resources, that they must be used efficiently and economically so that countries or groups of countries may have equitable access to both in conformity with the provisions of the Radio Regulations according to their needs and the technical facilities at their disposal." *Cf.* ITU, Thirteenth Report by the International Telecommunication Union on telecommunication and the peaceful uses of outer space 6 (Geneva, 1974).

In fact the geostationary orbit is not a resource as stated in this Article and some other ITU documents, but a functional position of an orbiting space object which maintains the same spot in outer space in relation to the earth and revolves round the earth with the same speed as our planet itself. Therefore, we should rather speak of geostationary satellite orbits the number of which is limited due to their unique position in space and use of radio frequencies. The phrase of "limited natural resources" in Article 33 of the International Telecommunication Convention should not be taken in the usual legal meaning of the term "natural resources" but understood rather as a comparison.



geostationary-satellite orbit as well as the need for an orderly development of the services to which these bands are allocated", simultaneously taking into account "the equal rights of all countries, large and small", even those countries which are not represented at the ITU actions.<sup>46</sup> The principle of preoccupation of all nations should remain how to develop further a reasonable and generally acceptable legal order governing present and future space activities in the interest of all countries, for the benefit of all mankind.

This would mean to take care of a genuine and continuing growth of the law of outer space. One of essential elements of the rule of law in outer space that should be settled now is just the delimitation of the exact territorial scope of validity of space law. Such delimitation cannot be accomplished without any precise definition of outer space. Had such definition, including an agreement on the lower boundary of outer space, been adopted in the earlier stage of space legislation, a firm legal obstacle against appropriation claims of individual States or any groups thereof would have been created and any claims of this kind could not have been advanced.

At the same time, it must be emphasized that the issue of the legal regime of the geostationary orbit cannot provide a proper answer to the question of defining outer space, both questions being of a different nature and significance. Even if we have to take into account all aspects involved, including the unique nature of the geostationary orbit, the question of defining outer space must be settled as such, *i.e.*, as an independent problem of the developing space law which is not to be subject to solutions of other issues.

### III. *Proposed Solution to the Question*

If the definition of outer space is to serve the latter's purpose, it should be global and invariable, clear and simple, rapidly determinable both from the ground and outer space. Only when fulfilling such requirements would the definition of outer space be easily applicable, although in considering these criteria, physical and other scientific aspects of the problem must be taken into account. The substance of the need for defining outer space and delimiting it from airspace is primarily of a political and legal nature because, on the one hand, the sovereignty of States and the territorial scope of their laws and, on the other hand, the scope of the validity of international agreements governing the activities in outer space are at stake.

The need for a definition of outer space is a consequence of the development of space flights. If adopted, such definition has to further, and not to create legal obstacles to, the expected growth of space activities. For the aims of space flights the most important delimitation line is that which establishes the lower limit of outer space while the question of upper limit of "airspace", *i.e.*, of that part of space which is governed by

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<sup>46</sup>C/7 Preamble to the Final Acts of the World Administrative Radio Conference for the Planning of the Broadcasting-Satellite Service in Frequency Bands 11.7-12.2 GHz (In Regions 2 and 3) and 11.7-12.5 GHz (In Region 1) (Geneva, 1977).

the principle of complete and exclusive sovereignty of subjacent States (a limit which need not necessarily coincide with the above-mentioned lower limit of outer space) is not so urgent and might be left aside for the time being. The question of using this part of space for the purpose of transit of space objects might be settled in another way, *i.e.*, by a general recognition of the right of passage or, in other terms, the right of access of space objects to and from outer space, including the freedom of transit through the airspace of States other than the launching State. Of course, such right—as was correctly observed by Professor Manfred Lachs of Poland, Judge of the International Court of Justice—“does not connote activities which may be contrary to the principles and rules of outer space law or international law in general, or which are directed against a subjacent State or jeopardize its rights.”<sup>47</sup>

Thus, the decisive criterion to be used as the basis for an agreement on establishing the lower limit of outer space should be of cosmonautical nature. In our opinion, there is but one such criterion that meets all the above mentioned requirements, namely, the lowest perigee at which space objects are still able to continue effectively in their orbiting around the earth for a longer period of time. Indeed, the lowest perigee of artificial earth satellites is and will remain constant for many years to come, notwithstanding the rapid progress in space technology. Moreover, such criterion meets the requirement of suitable applicability. As has been observed by Dr. Lubós Perek, an outstanding expert on scientific aspects of space, “the measuring of distance of any object in space can be made quickly with equipment which is not exceedingly expensive. Also the space objects themselves could, in principle, make such determinations.”<sup>48</sup>

As to the exact height of the lowest perigee, it is possible to consult several studies published in recent years. In a thorough paper prepared by Working Group 1 of the Committee on Space Research upon the request of the U.N. Committee on Outer Space, entitled “Study on Altitudes of Artificial Earth Satellites”, the conditions in the lowest altitudes at which satellites move and the disturbing forces, which can affect the diminishing of the height of the closest point of approach of a satellite to earth, were analyzed in great detail. According to this paper

“it seems that the past estimates of the lowest heights into which satellites can plunge, without falling down to the ground or burning up in the atmosphere, were too high. This is especially true for satellites with highly eccentric orbits which penetrate into the atmosphere for a limited time during each revolution around the Earth.”<sup>49</sup>

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<sup>47</sup>M. Lachs, *The Law of Outer Space: An Experience in Contemporary Law-Making* 61 (1972).

<sup>48</sup>L. Perek, *Remarks on Scientific Criteria for the Definition of Outer Space*, *Proc. Nineteenth Colloquium on the Law of Outer Space* 188-189 (1977).

<sup>49</sup>U.N. Doc. A/AC.105/164 at 4 and Annex I at 20 (1976).

As noted in this COSPAR study the lowest atmospherical depth into which artificial satellites of the earth have penetrated "is with good precision the height of 90 km."<sup>50</sup>

Therefore, the lower limit of outer space should be drawn not far from such height which represents a kind of natural boundary of space flights. Should the lower limit of outer space be located much higher, it would exclude from the realm of space law a significant part of space activities, including those with highly practical results. The performance of missions that would involve the penetration of objects into space below such limit would then require the consent of any subjacent State concerned. On the other hand, should the lower limit of outer space be located closer to earth, important interests of subjacent States falling within the category of national security might be affected without any proper benefit for space activities as such.

Furthermore, it is well to remember that other significant phenomena of a physical value also militate in favor of selecting the lowest relatively stable perigee of artificial earth satellites as the decisive criterion for the establishment of the lower limit of outer space. In the working paper entitled "Natural Boundaries in Space", submitted by Belgium at the thirteenth session of the Scientific and Technical Subcommittee of the UN Committee on Outer Space in 1976, the following facts were also recalled: The turbopause, being a boundary that separates two atmospheric regions with different physical properties, where air ceases to exist with its normal composition for principal constituents, is situated at the height of  $100 \pm$  km; the first persistent and important ionospheric level, *e.g.*, the so called E-region, occurs in the neighborhood of 100 km; atmospheric drag becomes important and also perceptible due to the glow of falling meteorites at  $100 \pm 10$  km; important and vast atmospheric regions lie beyond this limit, such as plasmasphere, magnetosphere, etc.<sup>51</sup> Indeed, up to the height of 100 km the composition of atmosphere remains similar to that of its dense layer surrounding the earth. In more distant regions, its composition widely differs. All such coincidences, however, are but subsidiary arguments which support the validity of the main criterion on which the delimitation can be effectively based.

As a matter of fact the lowest perigee where space objects are still able to continue in their orbiting around the earth has already imposed itself as a natural criterion for the delimitation of outer space. This natural delimitation has also been evidenced by the constant practice of States and their tacit consent to space activities accomplished so far at this distance and beyond it. On the basis of such practice, Professor Wojciech Goralczyk of Warsaw University defends the view that a principle has already emerged whereby in the height of orbits around the Earth, where objects launched by States

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<sup>50</sup>*Ibid.*

<sup>51</sup>The Question of the Definition and/or the Delimitation of Outer Space, U.N. Doc. A/AC.105/C.2/7/Add. 1 at 18-19 (1977).

move, the territorial supremacy of States does not prevail and such parts of space belong to outer space.<sup>52</sup>

Indeed, the criterion of the lowest perigee and the natural boundary of outer space arising from it should serve as the basis on which an agreement establishing a conventional boundary could be reached. Such conventional boundary might deviate from the basic criterion in one direction or the other taking into account all relevant viewpoints and interests of States. But in principle, it should follow the above mentioned natural line and confirm the already established custom.

In conclusion, it should be recalled that a Working Paper dealing with the approach to the solution of the problem was recently submitted by the delegation of the U.S.S.R. to the U.N. Legal Subcommittee on Outer Space. In this document it was suggested that an agreement be reached on the boundary between airspace and outer space at an altitude not exceeding 100/110 km above the sea level. At the same time, this document recommended retaining the right of space objects to fly over the territory of other States at lower altitudes for the purpose of reaching orbit or returning to earth in the territory of the launching State.<sup>53</sup>

We believe that this proposal has been well founded. It reflects actual practice of States performing space flights and at the same time preserves legitimate interests of subjacent States. Without any doubt, its adoption as the basis for a solution of the question of defining outer space would promote "the common interests of all mankind in the progress of the exploration and use of outer space for peaceful purposes".<sup>54</sup>

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<sup>52</sup>W. Goralczyk, *Prawo międzynarodowe publiczne w zarysie* 236 (1979).

<sup>53</sup>U.N. Doc. A/AC.105/C.2/L. 121 (1979), *reproduced* in the Report of the Legal Subcommittee on the Work of Its Eighteenth Session, March 12-April 6, 1979, U.N. Doc. A/AC.105/240, Annex IV., at 6 (1979).

<sup>54</sup>*Supra* note 44.

THE 1980 SESSION OF THE U.N. COMMITTEE ON THE  
PEACEFUL USES OF OUTER SPACE: HIGHLIGHTS OF POSITIONS ON  
OUTSTANDING LEGAL ISSUES

*Stephen Gorove\**

The United Nations Committee on the Peaceful Uses of Outer Space (UNCOPUOS) held its twenty-third session at United Nations Headquarters from 23 June to 3 July, 1980 under the chairmanship of Ambassador Peter Jankowitsch of Austria.<sup>1</sup> The Chairman opened the session with a statement reviewing the work of the Committee's subsidiary bodies<sup>2</sup> and outlining the work of the Committee which included *inter alia*, consideration of the item "applications of space science and technology and activities in outer space". The purpose of my presentation is to focus on some of the latest pronouncements reflecting positions of States on outstanding legal issues during the discussion of this item before the Committee.<sup>3</sup>

Under the topic of "applications of space science and technology and activities in outer space", the Committee had under consideration the following five subject matters: (a) the remote sensing of earth by satellites; (b) direct television broadcasting by satellites; (c) the definition and/or delimitation of outer space and outer space activities "bearing in mind, *inter alia*, questions relating to the geostationary orbit"; (d) the use of nuclear-power sources in outer space; and (e) space transportation systems. Some of the relevant points brought up in the deliberations may be conveniently presented under each of these subjects.

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<sup>1</sup>42 of the 47 members of the Committee were represented at the session. Those nations which did not send representatives included Albania, Chad, Iran, Lebanon and Sierra Leone. Representatives of the International Atomic Energy Agency (IAEA) and of the following specialized agencies attended the session: Food and Agriculture Organization of the United Nations (FAO), United Nations Educational, Scientific and Cultural Organization (UNESCO), International Telecommunication Union (ITU), World Meteorological Organization (WHO). Representatives of the European Space Agency (ESA), the Committee on Space Research (COSPAR) of the International Council of Scientific Unions (ICSU) and the International Astronautical Federation (IAF) also attended the session. Representatives of the Division for Natural Resources and Energy (DNRE) of the Department for Natural Resources and Energy (DNRE) of the Department of Technical Co-operation for Development (DTCD) of the United Nations Secretariat, of the Office of the United Nations Disaster Relief Co-ordinator (UNDRO) and of the United Nations Development Programme (UNDP) were also in attendance. See Doc. A/AC. 105/XXIII/INF. 1, and Add. 1 (1980).

<sup>2</sup>The Scientific and Technical Subcommittee's recent report on its work may be found in Doc. A/AC. 105/267 (1980) and that of the Legal Subcommittee in Doc. A/AC. 105/271 and Corr. 1 (1980).

<sup>3</sup>For earlier discussions of the Committee's work, see Hosenball, *The United Nations Committee on the Peaceful Uses of Outer Space: Past Accomplishments and Future Challenges*, 7 *J. Space L.* 95 (1979); Jankowitsch, *Contributions of the United Nations Committee on the Peaceful Uses of Outer Space: An Overview*, 5 *J. Space L.* 7 (1977).

(a) *Remote Sensing of the Earth by Satellites (RS)*

The formulation of draft principles to govern activities in relation to RS had been before the Legal Subcommittee for some years but—as the square brackets in the relevant text<sup>4</sup> indicate—thus far no consensus has been achieved. Differences of opinion continued to surface in the course of discussions before the Committee and some of the relevant views are summarized below:

Perceptible progress has been made regarding the development of a set of principles on RS (U.K.<sup>5</sup>);

No appreciable progress was made in the consideration of the legal implications of RS (Nigeria<sup>6</sup>);

Progress should not be slowed (France<sup>7</sup>);

Agreed-upon principles complementing existing international cooperative agreements should be formulated and maximum use by all interested nations should be facilitated; legal principles on RS should not be permitted to render practical arrangements more difficult or even impossible (U.S.<sup>8</sup>);

Internationally accepted juridical norms were necessary (Chile<sup>9</sup>);

There should be unrestricted dissemination of data and information resulting from RS activities (Italy<sup>10</sup>);

The distribution of data and information from RS required the consent of those States concerned (Soviet Union<sup>11</sup>);

The unconditional consent of the sensed State was essential prior to the dissemination of data (Bulgaria<sup>12</sup>);

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<sup>4</sup>Doc. A/AC.105/271, Annex II, pp. 7-11 (1980); reproduced *infra*, pp. 17-21.

<sup>5</sup>Doc. OS/961, p. 2 (1980).

<sup>6</sup>*Id.* at 5.

<sup>7</sup>*Id.* at 4.

<sup>8</sup>Docs. A/AC.105/PV.212, p. 17 (1980); OS/962, p. 5 (30 June 1980).

<sup>9</sup>Doc. OS/961, p. 4 (27 June 1980).

<sup>10</sup>Doc. OS/957, p. 4 (25 June 1980).

<sup>11</sup>Doc. OS/960, p. 3 (26 June 1980).

<sup>12</sup>Doc. A/AC.105/PV.205, p. 17 (1980).

Dissemination of data obtained by RS should be subject to the prior consent of the sensed State (Egypt<sup>13</sup>);

Was in favor of defending sovereign rights of nations regarding the dissemination of information about themselves (Brazil<sup>14</sup>);

Progress and economic interests of States and of the international community as a whole should be reconciled with the sovereignty of States over their natural resources (Turkey<sup>15</sup>);

The principle of sovereignty must be taken into account (France<sup>16</sup>);

Important issues included the rights of the sensed State (Chile<sup>17</sup>);

The sensed State had a priority right to obtain without cost information derived from RS and such State had a right to be consulted before information was made available to third parties in exchange for financial and political compensation (Ecuador<sup>18</sup>);

Sensed States should be assured timely and priority access to information resulting from RS but they should agree to reconcile their national interests with the interests of mankind as a whole (Italy<sup>19</sup>);

All states should have direct access to data relevant to their territory and all other data. It was important to eliminate discriminatory restrictions (Rumania<sup>20</sup>);

Emphasis should be placed on a solution for all states to have access to collected data (France<sup>21</sup>);

One must find ways to harmonize the interests of "sensed" countries and other countries, assuring that those other countries did not enjoy privileges (Belgium<sup>22</sup>);

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<sup>13</sup>Doc. OS/960, p. 6 (26 June 1980).

<sup>14</sup>Doc. A/AC. 105/PV. 205, p. 23 (1980).

<sup>15</sup>Doc. OS/960, p. 4 (26 June 1980).

<sup>16</sup>Doc. OS/961, p. 4 (27 June 1980).

<sup>17</sup>Doc. OS/963, p. 2 (1 July 1980).

<sup>18</sup>*Ibid.*

<sup>19</sup>Doc. OS/957, p. 4 (25 June 1980).

<sup>20</sup>Doc. OS/961, p. 7 (27 June 1980).

<sup>21</sup>*Id.* at 4.

<sup>22</sup>Doc. OS/961, p. 6 (27 June 1980).

Compromises were acceptable but the dissemination of data should be consistent with the economic and political interests of States (Poland<sup>23</sup>);

Prepared to share the data it had collected on natural resources with other countries (Argentina<sup>24</sup>);

The UN program should assist developing countries to analyze and interpret available data and expand RS stations in those countries (Italy<sup>25</sup>);

An important question was how to assure that data would be available on a continuing basis (Sweden<sup>26</sup>);

It would be better to consider prerequisites for coordinating a RS system for earth (Belgium<sup>27</sup>);

The RS issues are complex from a scientific as well as from a legal and political point of view (Poland<sup>28</sup>);

All delegations should use the terms "primary data" and "analyzed information" for greater clarity (Canada<sup>29</sup>);

The focus of the work should be on the practical aspects of RS technology (Rumania<sup>30</sup>);

In some of the additional discussions the view was also expressed that the lack of progress in this area was due to the fact that the total range of earth observation satellites extending from meteorological satellites to surveillance satellites was not taken into account<sup>31</sup>. Having heard the different views of Member States on outstanding issues the Committee recommended that the Legal Subcommittee should continue, on the basis of priority, to give detailed consideration to the legal implications of RS of the earth from space, with the aim of formulating draft principles.<sup>32</sup>

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<sup>23</sup>*Id.* at 5.

<sup>24</sup>Doc. OS/957, p. 3 (25 June 1980).

<sup>25</sup>Doc. OS/962, p. 8 (30 June 1980).

<sup>26</sup>Doc. A/AC. 105/PV. 205, p. 28 (1980).

<sup>27</sup>Doc. OS/961, p. 6 (27 June 1980).

<sup>28</sup>Doc. A/AC. 105/P.V. 212, p. 33 (1980).

<sup>29</sup>*Supra* note 26 at 8.

<sup>30</sup>Doc. A/AC. 105/PV. 213, p. 17 (1980).

<sup>31</sup>Doc. A/35/20, p. 6. (1980).

<sup>32</sup>*Id.* at 6-8.



*b. Direct Television Broadcasting by Satellites (DBS)*

The elaboration of draft principles governing the use by States of artificial earth satellites for direct television broadcasting had been on the agenda of the Legal Subcommittee for a number of years but as in the case of remote sensing the square brackets in the relevant text<sup>33</sup> reveal that thus far no consensus has emerged on a number of key issues. Some of the views which were expressed in the discussions before the Committee may be summed up as follows:

No appreciable progress was made in the formulation of principles governing the use of DBS by States (Nigeria<sup>34</sup>);

It was essential to formulate principles (India<sup>35</sup>, similarly: Egypt<sup>36</sup>);

Free dissemination of information across frontiers and the right to receive and impart information were essential (U.K.<sup>37</sup>, similarly: U.S.,<sup>38</sup> F.R.G.<sup>39</sup> and Italy<sup>40</sup>);

All efforts at regulation should be made within limits of full respect for the principle of free flow of information, freedom of the press and opinion (F.R.G.<sup>41</sup>);

Although it had not yet taken a final position on all the recommendations of the MacBride Commission which was established in the framework of UNESCO, it fully agreed to the basic approach by the Commission which was directed at a free and better balanced flow of information and communication (Netherlands<sup>42</sup>);

Does not share the view that the MacBride report contains a confirmation of the existence of the free flow of information in international relations. On the contrary, the conclusions of the report confirm the need to respect State sovereignty in carrying out information activities at the international level and to assist developing countries in

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<sup>33</sup>Doc. A/AC. 105/271, Annex I, pp. 6-11 (1980), reproduced in Current Documents I, *infra*.

<sup>34</sup>Doc. OS/961, p. 5 (27 June 1980).

<sup>35</sup>Doc. A/AC. 105/PV. 212, p. 61 (1980).

<sup>36</sup>Doc. OS/962, p. 9 (30 June 1980).

<sup>37</sup>Doc. OS/961, p. 2 (27 June 1980).

<sup>38</sup>Doc. A/AC. 105/PV. 213, pp. 23-5 (1980).

<sup>39</sup>Doc. OS/957, p. 6 (25 June 1980).

<sup>40</sup>*Id.* at 4.

<sup>41</sup>*Id.* at 6.

<sup>42</sup>Doc. 957, p. 10 (25 June 1980).

organizing national communication infrastructures and a balanced flow of information on the basis of cooperation and agreement (Soviet Union<sup>43</sup>);

Legal regulations of DBS required flexibility. Any principles on DBS should be based only on agreements among States concerned (Soviet Union<sup>44</sup>);

The DBS issue should be decided on the basis of the sovereign rights of States and consent of the receiving State should be a prerequisite to DBS (Poland,<sup>45</sup> similarly: Romania,<sup>46</sup> Chile,<sup>47</sup> Soviet Union<sup>48</sup>);

It was vital to respect the sovereignty of the recipient States and their right to preserve and develop their own tradition and culture (Egypt<sup>49</sup>);

A country had the right to be informed beforehand about DBS into the country; there had to be a previous agreement between the receiving and launching States (Mexico<sup>50</sup>, similarly: Ecuador<sup>51</sup>);

Concerns of the receiving State had to be taken into account (France<sup>52</sup>);

Consultation and agreement between States should include the concept of respect of the broadcasting State for the concerns of the receiving State (Indonesia<sup>53</sup>);

The contention that Article 19 of the Declaration of Human Rights obliged authorization of DBS could not be deemed applicable (Colombia<sup>54</sup>);

The principle of free flow of information should be respected so long as it dovetailed with the inalienable right of States to protect their social patrimony (Chile<sup>55</sup>);

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<sup>43</sup>Doc. A/AC. 105/PV. 212, p. 36 (1980).

<sup>44</sup>Doc. OS/960, p. 3 (26 June 1980).

<sup>45</sup>Doc. A/AC. 105/PV. 212, p. 32 (1980).

<sup>46</sup>Doc. OS/961, p. 7 (27 June 1980).

<sup>47</sup>Doc. OS/963, p. 2 (1 July 1980).

<sup>48</sup>Doc. OS/962, p. 7 (30 June 1980).

<sup>49</sup>Doc. OS/960, p. 6 (26 June 1980).

<sup>50</sup>Doc. OS/961, p. 3 (27 June 1980).

<sup>51</sup>Doc. A/AC. 105/PV. 213, pp. 9-11 (1980).

<sup>52</sup>Doc. OS/961, p. 4 (27 June 1980).

<sup>53</sup>Doc. OS/960, p. 7 (26 June 1980).

<sup>54</sup>Doc. OS/961, p. 8 (27 June 1980).

<sup>55</sup>Docs. OS/961, p. 3 (27 June 1980); A/AC. 105/PV. 213, p. 6 (1980).

The text presented by Sweden and Canada in 1979 constituted a fair and balanced basis for compromise. In the formulation of legal principles regarding DBS special consideration should be given to the interests and requirements of the developing countries and the sovereignty of States should be fully taken into account (Turkey<sup>56</sup>);

ITU has already established a comprehensive body of regulations on DBS (U.K.<sup>57</sup>);

The norms contained in the instruments of ITU provide more than adequate protection for the legitimate interests of all States (U.S.<sup>58</sup>);

An acceptable solution might be based on a definition of consecutive responsibilities taking into account the principles and contents of programmes defined as illicit and inadmissible (Italy<sup>59</sup>);

The views advanced and related discussions revealed no specific progress with regard to outstanding issues and the Committee recommended that the Legal Subcommittee at its next session continue, as a matter of priority, its efforts to conclude the elaboration of principles governing the use by States of DBS.<sup>60</sup>

*(c) Definition and/or Delimitation of Outer Space and Outer Space Activities Bearing in Mind Questions Relating to the Geostationary Orbit*

It may be recalled that during the 1980 session of the Legal Subcommittee there were differences of opinion among delegates as to whether it was necessary to have a demarcation line between airspace and outer space<sup>61</sup> such as the one proposed by the Soviet Union to the effect that outer space should begin at 100-110 km above sea level.<sup>62</sup> Some of the views advanced before the Committee may be summarized as follows:

To avoid conflict between the norms of air law and space law a precise spacial delimitation was necessary (Soviet Union<sup>63</sup>);

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<sup>56</sup>Doc. OS/960, p. 4 (26 June 1980).

<sup>57</sup>Doc. OS/961, p. 2 (27 June 1980).

<sup>58</sup>Doc. A/AC. 105/PV. 213, p. 26 (1980).

<sup>59</sup>Doc. A/AC. 105/PV. 213, p. 21 (1980).

<sup>60</sup>Doc. A/35/20, p. 8 (1980).

<sup>61</sup>Doc. A/AC. 105/271, p. 8 (1980).

<sup>62</sup>For the Soviet Union's working paper, see Doc. A/AC. 105/C. 2/L. 121.

<sup>63</sup>Doc. A/AC. 105/PV. 212, pp. 37-40 (1980).

It is absolutely necessary to have a definition as to where outer space begins . . . The height of 100 kilometers should be established (German Democratic Republic<sup>64</sup>);

Reaffirmation of the customary delimitation of outer space at the height of 100-110 km was fully justified (Poland<sup>65</sup>);

The Soviet proposal would not solve any problem, but would rather raise the problem of "creeping jurisdiction", providing an ever-present temptation to expand the zone subject to sovereignty . . . What would happen to activities now regarded as space activities which took place below the proposed boundary? . . . Up to now the development of space activities had proceeded without a boundary. The activities themselves could be regulated through the establishment of international rules . . . that was the course followed in five outer space instruments now in existence. That course should be continued (Netherlands<sup>66</sup>);

It is very difficult to establish scientific criteria for delimiting outer space. The matter is an extremely difficult issue . . . It should be dealt with as comprehensively as possible and the Scientific and Technical Sub-Committee should continue to study this issue. To define outer space, it will be increasingly necessary to take account of criteria which, by their very nature, evolve with time (France<sup>67</sup>);

Prepared to take a flexible attitude (Austria<sup>68</sup>);

Any definition of outer space must include a legal regime, *sui generis*, including the geostationary orbit. The geostationary orbit was subject to the sovereignty of the subjacent States but the sovereignty of the equatorial States must be exercised for the benefit of mankind. Thus a legal regime was necessary (Indonesia<sup>69</sup>);

The geostationary orbit is an inseparable part of outer space and no segment thereof can be claimed to be national property (German Democratic Republic<sup>70</sup>);

The geostationary orbit is a complex issue. . . But the legal status of this part of outer space cannot be based on unilateral claims contrary to international law. The partition of outer space would undermine the fundamental principle of space law: free access to all parts of outer space (Poland<sup>71</sup>);

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<sup>64</sup>Doc. A/AC. 105/PV. 213, pp. 28-30 (1980).

<sup>65</sup>Doc. A/AC. 105/PV. 212, p. 33 (1980).

<sup>66</sup>Doc. OS/962, p. 6 (30 June 1980).

<sup>67</sup>Doc. A/AC. 105/PV. 213, p. 32 (1980).

<sup>68</sup>Doc. OS/957, p. 5 (25 June 1980).

<sup>69</sup>Doc. OS/960, p. 8 (26 June 1980).

<sup>70</sup>Doc. A/AC. 105/PV. 213, p. 31 (1980).

<sup>71</sup>Doc. A/AC. 105/PV. 212, p. 33 (1980).

100 km was the most feasible height for the determination of the delimitation of outer space but there was no nexus between the altitude to be set for the delimitation of space and the one set by the laws of gravity for the geostationary orbit. . . The delegate did not object to free orbital transit but this did not include devices placed over his country in fixed orbit (Colombia<sup>72</sup>);

The geostationary orbit was the heritage of all mankind and the use of the orbit should not confer any priority to any country (Egypt<sup>73</sup>);

The use of the geostationary orbit must be regulated and such use should be for the good of the international community, particularly the developing nations (Ecuador<sup>74</sup>);

All countries must have a real possibility of gaining access to the geostationary orbit (Chile<sup>75</sup>);

There must be respect for the *sui generis* nature of the geostationary orbit the use of which must be regulated (Ecuador<sup>76</sup>, similarly: Colombia<sup>77</sup>);

The geostationary orbit was a finite natural resource, the use of which could not be made contingent solely on the technological capacity of certain countries or the seniority of those States which had made use of it first (Ecuador<sup>78</sup>);

It is difficult to accept a "first come, first served" attitude, instead a legal framework should be established to provide equitable access to the geostationary orbit for all countries, with due regard being paid to their different needs (Brazil<sup>79</sup>);

The fact that there might be an allocation of satellite orbits in perpetuity was at variance with international law (Colombia<sup>80</sup>);

It was necessary to continue efforts in elaborating principles to complement existing international instruments with regard to the geostationary orbit (Mexico<sup>81</sup>);

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<sup>72</sup>Doc. OS/961, pp. 7-8 (27 June 1980).

<sup>73</sup>Doc. A/AC. 105/PV. 212, p. 64 (1980).

<sup>74</sup>Doc. OS/963, p. 2 (1 July 1980).

<sup>75</sup>Doc. OS/961, p. 4 (27 June 1980).

<sup>76</sup>Doc. OS/963, p. 2 (1 July 1980).

<sup>77</sup>Doc. OS/961, p. 8 (27 June 1980).

<sup>78</sup>*Supra* note 76.

<sup>79</sup>Doc. A/AC. 105/PV. 205, p. 23 (1980).

<sup>80</sup>Doc. OS/961, p. 8 (27 June 1980).

<sup>81</sup>*Id.* at 3.

In view of the ever-increasing number of satellites in the geostationary orbit, a more thorough examination of the relevant problems should lead to the formulation of appropriate understandings in order to ensure the most efficient and economical means of using the orbit, including equal access for all interested States (Austria<sup>82</sup>);

Equitable legal regime ought to be established in order to ensure that the geostationary orbit, which was a limited natural resource, should be utilized for the benefit of all countries and in particular the developing countries (Turkey<sup>83</sup>);

The MacBride report's suggestion of the possibility of imposing an international duty on the use of the geostationary orbit in order to secure sufficient financial resources for development in the field of communications for the benefit of the developing countries could be explored further, since it was correctly founded on the concept of the geostationary orbit as a phenomenon to be exploited for the benefit of all, regardless of the level of technological development or geographical position (Italy<sup>84</sup>);

In the area of delimitation of outer space and the question of a geostationary orbit, technical problems were dominant requiring reserve in dealing with them (France<sup>85</sup>);

Apart from the foregoing views special reference was made by some delegations to Resolution BP of the 1979 World Administrative Radio Conference concerning the planning of space services utilizing the geostationary orbit which stipulated that "Attention should be given to relevant technical aspects concerning the special geographical situation of particular countries".<sup>86</sup> Some of the delegates expressed the view that pertinent sections of this resolution were meant to provide for the special interests of equatorial countries; other delegations, however, were of the view that the relevant parts of that resolution referred to polar and certain tropical and desert countries where geographical and climatic conditions affected signals from satellites.<sup>87</sup>

The Committee took note of the varying views expressed by the different delegations and endorsed the request of its Scientific and Technical Subcommittee that the study on the physical nature and technical attributes of the geostationary orbit continue to be brought up to date as required.<sup>88</sup>

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<sup>82</sup>Doc. OS/957, pp. 5-6 (25 June 1980).

<sup>83</sup>Doc. OS/960, p. 5 (26 June 1980).

<sup>84</sup>Doc. OS/957, p. 10 (25 June 1980).

<sup>85</sup>Doc. OS/961, p. 4 (27 June 1980).

<sup>86</sup>For a discussion and analysis of this resolution, see Gorove, *The World Administrative Radio Conference: Some Legal and Political Implications*, 29 *Zeitschrift f. Luft- und Weltraumrecht* 214 at 217 *ff.* (1980).

<sup>87</sup>Doc. A/35/20, p. 9 (1980).

<sup>88</sup>*Ibid.*

*(d) Use of Nuclear Power Sources (NPS) in Space*

The review of existing international law relevant to outer space activities with a view of determining the appropriateness of supplementing such law with provisions relating to the use of NPS in outer space has been on the agenda of the 1980 session of the Legal Subcommittee<sup>89</sup> and also discussed during the 1979 and 1980 sessions of the Scientific and Technical Subcommittee<sup>90</sup>. Also in this area the divergent views which were apparent at the sessions of the Subcommittees came again to the fore during the discussions before the Committee. Some of the stated positions may be summed up as follows:

Existing international law was insufficient because it did not adequately cover the use of NPS in outer space; (Venezuela,<sup>91</sup> similarly: Mexico<sup>92</sup>);

The first four space treaties contained legal provisions but gaps remained which should be filled (U.K.<sup>93</sup>);

Provisions concerning the use of NPS for satellites should be incorporated into the current body of international law . . . to ensure maximum protection of human beings and their environment . . . against the risks inherent in the use of NPS (F.R.G.<sup>94</sup>, similarly: Austria<sup>95</sup>, Italy<sup>96</sup>);

Positive rules of law were necessary (Colombia<sup>97</sup>, similarly: Ecuador<sup>98</sup>);

New rules and procedures were needed to govern the use of NPS in outer space. Those should include: the publication of appropriate safety analyses by States which launch such vehicles; the establishment of requirements for notification prior to the re-entry of a malfunctioning spacecraft which includes a nuclear power source; and the provision of

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<sup>89</sup>Doc. A/AC. 105/271, p. 4 (1980).

<sup>90</sup>Docs. A/AC. 105/238, p. 2 (1979); A/AC. 105/267, p. 2 (1980).

<sup>91</sup>Doc. A/AC. 105/PV. 213, p. 16.

<sup>92</sup>Doc. OS/961, p. 3 (27 June 1980).

<sup>93</sup>*Id.* at 2.

<sup>94</sup>Doc. OS/957, p. 7 (25 June 1980).

<sup>95</sup>*Id.* at 5.

<sup>96</sup>*Id.* at 4.

<sup>97</sup>Doc. OS/961, p. 7 (27 June 1980).

<sup>98</sup>Doc. OS/963, p. 2 (1 July 1980).

assistance in locating debris from a spacecraft containing NPS and assisting in any subsequent clean-up activities (U.S.<sup>99</sup>);

Two things were essential: review of existing international law and determination of desirability of drafting new instruments (Canada<sup>100</sup> similarly: Japan<sup>101</sup>);

There were four areas where provisions on NPS were required:

- (a) information regarding its use,
- (b) notification prior to reentry,
- (c) assistance to States in an emergency,
- (d) radiation exposure levels; (Canada<sup>102</sup>, similarly: Italy<sup>103</sup>, Turkey<sup>104</sup>);

Existing international legal norms on NPS were appropriate and provided adequate regulation. However, further study could be done to improve the use of existing international law (Soviet Union<sup>105</sup>);

Existing international law instruments were adequate in providing all the necessary provisions to deal with the use of NPS in space (Poland<sup>106</sup>, similarly: Czechoslovakia<sup>107</sup>, Hungary<sup>108</sup>);

The review of existing space law does provide some grounds for saying that there is no real need to supplement existing law with special provisions on the use of NPS in outer space (Bulgaria<sup>109</sup>);

No special working group was necessary to consider the use of NPS in space; (Soviet Union<sup>110</sup>, similarly: Hungary<sup>111</sup>);

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<sup>99</sup>Doc. OS/962, p. 6 (30 June 1980).

<sup>100</sup>*Id.* at 4.

<sup>101</sup>Doc. OS/957, p. 8 (25 June 1980).

<sup>102</sup>Doc. OS/962, p. 4 (30 June 1980).

<sup>103</sup>*Id.* at 8.

<sup>104</sup>Doc. OS/960, p. 4 (26 June 1980).

<sup>105</sup>*Id.* at 3.

<sup>106</sup>Doc. A/AC. 105/PV. 212, p. 34 (1980).

<sup>107</sup>Doc. OS/958, p. 3 (25 June 1980).

<sup>108</sup>Doc. A/AC. 105/PV. 213, p. 22 (1980).

<sup>109</sup>Doc. A/AC. 105/PV. 205, p. 18 (1980).

<sup>110</sup>Doc. OS/962, p. 8 (30 June 1980).

<sup>111</sup>*Supra* note 108.



Legal aspects of emergency assistance for States on whose territory parts of damaged space object carrying NPS might enter may be reviewed (Poland<sup>112</sup>);

Internationally accepted guidelines are essential, where an activity results in radiation exposure among populations outside the country responsible for the activity in question. In the case of ordinary nuclear power production, many countries have accepted even more stringent rules than the guidelines elaborated by the International Commission on Radiological Protection (ICRP). NPS in outer space should not be excluded from such minimum guidelines (Sweden<sup>113</sup>);

Additional standards and norms were necessary on NPS (Rumania<sup>114</sup>).

In addition to the preceding summations of views reflecting positions on outstanding issues, the view was also advanced that consideration should be given to the establishment of an adequate global tracking system to ensure the best possible information and prediction of reentry and impact. The view was also expressed that there was a need for the initiation of a program to train specialized teams from various countries, particularly the developing nations, to deal effectively with cases of accidental reentry.<sup>115</sup>

The Committee noted that the Scientific and Technical Subcommittee had reestablished its Working Group of Experts in order to continue its consideration of the technical aspects and safety measures relating to the use of NPS in outer space and endorsed the recommendation of the Working Group that arrangements be made for it to meet during the Scientific and Technical Subcommittee's next session.<sup>116</sup>

*(e) Space Transportation Systems (STS) and their Implications for Future Activities in Space*

It may be recalled that the Scientific and Technical Subcommittee had considered the matter of space transportation systems and their implications for future activities in space.<sup>117</sup> In the course of the general exchange of views, the Committee heard statements on various programs related to STS in operation or planned, including programs reported by the Soviet Union concerning Soyuz and Progress, France

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<sup>112</sup>Doc. A/AC.105/PV.212, pp. 34-5 (1980).

<sup>113</sup>Doc. A/AC.105/PV.205, pp. 29-30 (1980).

<sup>114</sup>Doc. OS/961, p. 7 (27 June 1980).

<sup>115</sup>Doc. A/35/20, p. 10 (1980).

<sup>116</sup>*Id.* at 9-10.

<sup>117</sup>Doc. A/AC.105/267, p. 2 (1980).

concerning Ariane, the United States concerning the Shuttle and the European Space Agency regarding Ariane and Spacelab.<sup>118</sup>

### *Concluding Observations*

The foregoing review of some of the key positions of States reflect substantial differences of opinion on several basic issues. Even a perfunctory glance without the benefit of an in-depth content analysis which is outside the scope of this inquiry, reveals the nature and degree of these differences. They range from the idea of "unrestricted dissemination of data and information" to the opposite concept of "unconditional consent of the sensed State prior to dissemination" of RS data, from the principle of "free flow of information, freedom of the press and opinion" to the counter proposition of "consent of the receiving State" to DBS and from a "precise spacial delimitation" to the notion that any "criteria" for the definition of outer space "by their very nature" would "evolve with time". They cover contradicting statements such as that the "geostationary orbit is an inseparable part of outer space" and that it is "subject to the sovereignty of the subjacent States", that "existing international law was insufficient because it did not adequately cover the use of NPS in outer space" and that "existing international law instruments were adequate in providing all the necessary provisions to deal with the use of NPS in space".

While the nature and intensity of the differences may vary from issue to issue and the perceived effect of acceptance of opposite positions on professed value schemes and potentials of a party may equally vary, it will be the task of policy-makers, diplomats and legal technicians to review their positions, seek bridges, and explore suggested approaches in order to find acceptable solutions. It is hoped that the preceding survey will serve to facilitate such exploration and review.

Which one of the reviewed areas will be the most likely target for an early solution is hard to predict with absolute certainty at this time. Problems pertaining to RS, the delimitation of outer space and the geostationary orbit may offer more tangible hope for an earlier solution but those involving the use of DBS and NPS in outer space eventually may also lead to some form of understanding.

International space law has made enormous progress in a relatively short span of time due largely to the unceasing efforts of delegations within the Committee on the Peaceful Uses of Outer Space and its Subcommittees. Only dedication, perseverance and patient diplomacy in an unobtrusive international political climate, coupled with legal ingenuity and skill of draftsmanship, can continue to pave the way for further progress in this increasingly important and challenging area of the law.

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<sup>118</sup>*Id.* at 11.

## I.

TEXTS OF DRAFT PRINCIPLES AS CONTAINED IN THE REPORT OF THE  
LEGAL SUB-COMMITTEE ON THE WORK OF ITS EIGHTEENTH SESSION<sup>+</sup>PRINCIPLES GOVERNING THE USE BY STATES OF ARTIFICIAL EARTH  
SATELLITES FOR [INTERNATIONAL]\* DIRECT TELEVISION BROADCASTING

*The General Assembly,*

(1) *In view of* of the benefits of international direct television broadcasting by means of artificial earth satellites for individuals, peoples, countries and all mankind,

(2) *Desiring* to safeguard the legitimate rights and interests of all States and to encourage orderly development on an equitable basis of this new and promising means of television broadcasting,

(3) *Recognizing* the unique characteristics of such satellite broadcasting not encountered in other forms of broadcasting which necessitate besides relevant technical regulations also legal principles solely applicable in this field.

(4) *Considering* that States, as well as international governmental and non-governmental organizations, including broadcasting associations, should base their activities in this field upon and encourage international co-operation,

(5) *Solemnly declares* that in international direct television broadcasting by means of artificial earth satellites, States should be guided by the following principles:

[1a. *Recognizing* that international direct broadcasting by means of artificial earth satellites should be based on strict respect for the sovereign rights of States and non-interference in their internal affairs,]

[1b. *Considering* that direct television broadcasting by means of satellites should take place under conditions in which this new form of space technology will serve the lofty goals of peace and friendship among peoples;]

[1c. *Recognizing* the importance for free dissemination of information and ideas and a broader exchange of views between all countries of the world;]

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<sup>+</sup> Taken from U.N. Comm. on the Peaceful Uses of Outer Space Report of the Legal Sub-Committee on the Work of its Nineteenth Session (10 March-3 April 1980), Doc. A/AC.105/271, Annex I, pp. 6-11 (1980). The text of this document is identical with that found in Doc. A/AC.105/240, Annex II, Appendix A (1979).

\*The term "international direct television broadcasting" is to be defined.

[1d. *Recognizing* the importance of the right of everyone to freedom of expression, including the right to seek, receive and impart information and ideas regardless of frontiers, as enshrined in instruments of the United Nations relating to universal human rights.]

*Purposes and objectives*

Activities in the field of international direct television broadcasting by means of artificial earth satellites should\* be carried out in a manner compatible with the development of mutual understanding and the strengthening of friendly relations and co-operation among all States and peoples in the interest of maintaining international peace and security. Such activities should, *inter alia*, promote the dissemination and mutual exchange of information and knowledge in cultural and scientific fields, assist in educational, social and economic development, particularly in the developing countries and enhance the quality of life of all peoples.

*Applicability of international law*

Activities in the field of direct television broadcasting by means of artificial earth satellites should be conducted in accordance with international law, including the Charter of the United Nations, the Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and other Celestial Bodies of 27 January 1967, the relevant provisions of the International Telecommunication Convention and its Radio Regulations and of International Instruments relating to friendly relations and co-operation among States and to human rights.

*Rights and benefits*

Every State has an equal right to conduct activities in the field of direct television broadcasting by means of artificial earth satellites and to authorize such activities by persons and entities under its jurisdiction. All States and peoples are entitled to and should enjoy the benefits from such activities. Access to the technology in this field should be available to all States without discrimination on terms mutually agreed by all concerned.

*International cooperation*

Activities in the field of direct television broadcasting by means of artificial earth satellites should be based upon and encourage international co-operation. Such co-operation should be the subject of appropriate arrangements.\*

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\*Use of the terms "should" and "shall" will be reviewed later when formulation of the principles is complete and it is clear what status the principles are to have and uniformity of terminology is considered.

\*Subject to review of the second sentence in the light of the discussion on consent and participation.

*State responsibility*

[States should bear international responsibility for activities in the field of direct television broadcasting by means of artificial earth satellites carried out by them or under their jurisdiction and for the conformity of any such activities with the principles set forth in this document.]

When direct television broadcasting by means of artificial earth satellites is carried out by an international intergovernmental organization, responsibility for compliance with these principles should be borne both by such organization and by States participating in it.

*Duty and right to consult*

[Any State requested to do so by another State should promptly enter into consultations with the requesting State concerning any matter arising from those activities in the field of international direct television broadcasting by satellites that are likely to affect the requesting State, and such consultations should be conducted with due regard to the other principles of this document.]

*Peaceful settlement of disputes\*\**

Any dispute that may arise from activities in the field of direct television broadcasting by means of artificial earth satellites should be resolved by prompt consultations among the parties to the dispute. Where a mutually acceptable resolution cannot be achieved by such consultations, it should be sought through other established procedures for the peaceful settlement of disputes.

*Copyright and neighbouring rights*

Without prejudice to the relevant provisions of international law States should co-operate on a bilateral and multilateral basis for protection of copyright and neighbouring rights by means of appropriate agreements between the interested States or the competent legal entities acting under their jurisdiction. In such co-operation they should give special consideration to the interests of developing countries in the use of direct television broadcasting for the purpose of accelerating their national development.

*Notification to the United Nations*

In order to promote international co-operation in the peaceful exploration and use of outer space, States conducting or authorizing activities in the field of direct television broadcasting by satellites should inform the Secretary-General of the United Nations to the greatest extent possible of the nature of such activities. On receiving this information, the Secretary-General of the United Nations should disseminate it immediately and effectively to the relevant United Nations specialized agencies, as well as to the public and the international scientific community.

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\*\*Some delegations indicated that they had a preference for the text in paragraph 15 of the report of the Chairman of the Working Group.

*Consultation and agreements between States*

1. [A direct television broadcasting service by means of artificial earth satellites specifically directed at a foreign State, which shall be established only when it is not inconsistent with the provisions of the relevant instruments of the International Telecommunication Union, shall be based on appropriate agreements and/or arrangements between the broadcasting and receiving States or the broadcasting entities duly authorized by the respective Statewider dissemination of information of all kinds and to encourage co-operation in the field of information and the exchange of information with other countries.]

2. [For that purpose a State which proposes to establish or authorize the establishment of broadcasting service by means of artificial earth satellites specifically directed at a foreign State shall without delay notify that State of such intention and shall promptly enter into consultations with that State if the latter so requests.]\*

3. [No such agreements and/or arrangements shall be required with respect to the overspill of the radiation of the satellite signal within the limits established under the relevant instruments of the International Telecommunication Union.]

[(b) No such agreements and/or arrangements or consultations shall be required with respect to the overspill of the radiation of the satellite signal within the limits established under the relevant instruments of the International Telecommunication Union.]

[(c) Delete paragraph 3.]

[(d) This principle shall not apply with respect to the overspill of the radiation of the satellite signal within the limits established under the relevant instruments of the International Telecommunication Union.]

*Programme content*

[States or their broadcasting entities which participate in direct television broadcasting by satellite with other States should co-operate with one another in respect of programming, programme content, production and interchange of programmes.]

[The broadcasting of advertising, direct or indirect to countries other than the country of origin should be on the basis of appropriate agreements between the countries concerned.]

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\*Some delegations considered that, owing to the wording of the principle on "consultation and agreements between States", the principle on "duty and right to consult" should be reconsidered in order to avoid inconsistencies and redundancies.

[Notwithstanding the foregoing, States undertaking activities in direct television broadcasting by satellites should in all cases exclude from the television programmes any material which is detrimental to the maintenance of international peace and security, which publicizes ideas of war, militarism, national and racial hatred and enmity between peoples, which is aimed at interfering in the domestic affairs of other States or which undermines the foundations of the local civilization, culture, way of life, traditions or language.]

*Unlawful/inadmissible broadcasts*

[States shall regard as unlawful and as giving rise to the international liability of States direct television broadcasts specifically aimed at a foreign State but carried out without the express consent of the latter, containing material which according to these principles should be excluded from programmes, or received as a result of unintentional radiation if the broadcasting State has refused to hold appropriate consultations with the State in which the broadcasts are received.]

[In case of the transmission to any State of television broadcasts which are unlawful, that State may take in respect of such broadcasts measures which are recognized as legal under international law.]

[States agree to give every assistance in stopping unlawful direct television broadcasting by satellite.]

[Any broadcasts that a State does not wish to be made in its territory or among its population and in respect of which it has made known such decision to the broadcasting State are inadmissible.]

[Every transmitter, State, international organization or authorized agency shall refrain from making such broadcasts or shall immediately discontinue such broadcasts if it has begun to transmit them.]

II.

**DRAFT RESOLUTION ON SPACE LAW FOR ADOPTION BY THE BELGRADE  
CONFERENCE OF THE I.L.A. (AUGUST, 1980)\***

I.

*Delimitation of Outer Space and Air Space*

[The Belgrade Conference of the International Law Association (I.L.A.):]

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\*Submitted to the Conference for adoption by the Space Law Committee of the I.L.A.

Recommends that the Space Law Committee in conjunction with the Air Law Committee pursue further the study of the urgent problems of establishing a boundary between outer space and air space, together with the problem of a right of passage for non-military space objects with a view to making specific recommendations on this issue to the 60th Conference of the Association.

## II.

### *Settlement of Space Law Disputes*

[The Belgrade Conference of the I.L.A.:]

*Notes with approval* that, in response to the recommendation of the 58th Conference, the Space Law Committee studied the problem of the *settlement of space law disputes* and cooperated in organizing an international colloquium on this topic in Munich in September 1979 resulting in a collection of the relevant materials and views which meanwhile appeared in a publication;

*Recommends* that the Committee continue its work in this matter with a view to drawing up a *draft convention* on the settlement of space law disputes.



## A. Past Events

1. *Space Law Session, Belgrade Conference of the International Law Association, August 18, 1980.*(a) *Introductory Remarks*

Our Association in 1968, at the *Buenos Aires Conference* took a lead directed towards a solution of the demarcation problem. In an unanimously accepted Resolution it was considered that the term outer space as used in the Outer Space Treaty should be interpreted so as to include all space at and above the lowest perigee achieved by the 27th January 1967, when the Treaty was opened for signature, by any satellite put into orbit, without prejudice to the question whether it may or may not later be determined to include any part below such perigee.

Ten years later, in the *Manila Resolution* of 1978 it was stated that the space at and above the altitude of 100 km. has been *growingly acknowledged* by States as well as by legal experts as outer space. In the Resolution it was further recommended that the Space Law Committee should study the question as to whether the sovereignty above the surface territory of States extends to this height.

As to the establishment of a rule of *freedom for spacecraft through the airspace* of other States for the purpose of putting them into orbit or for returning them to earth, the Conference welcomed the growing support for the establishment of such a rule - considering however that the final formulation of this rule should take into account the political and economic implications involved.

In the Report to the present Conference a short survey has been given of the present attitude of States to the problems I just mentioned and special attention was drawn to the Soviet proposal made in the U.N. Legal Sub-Committee on Outer Space on 20th June last year (p. 33 of the Report). Although the *main* principles laid down in this proposal received a considerable measure of support, a number of States expressed certain reservations.

As Chairman of the Space Law Committee I prepared a Questionnaire of the various problems involved, to which answers from several members of our Committee were received. Some short observations on these answers follow.

Referring to the first question as to whether the boundary should be fixed at 100-110 km. or perhaps slightly lower, five of the members who answered this question declared themselves in favour of fixing the boundary at the altitude of 100 km; one member, *Professor Bakotic*, considers that the boundary might be fixed slightly lower but never lower than the lowest perigee of satellites.

*Professor Zhukov* suggested that a rule of customary law had already been formed, according to which the orbits of satellites including their lowest perigee are regarded as

placed in outer space. Although it is undoubtedly of great significance that since the first Sputnik was put into orbit in October 1957, *no* State, during a period of more than two decades, has either by acts or words protested against the thousands of satellites which have traversed the space above their territories, the general expectation of the continuation and strengthening of the view that to allow States to exercise sovereignty at or above the lowest perigee of satellites would to an unacceptable extent invalidate the fundamental principle of freedom of outer space, has unfortunately been partly frustrated by the Bogota Declaration of 8 Equatorial States.

Although the claims of these States over parts of the geostationary orbit have been rejected by all other States, as their acceptance would lead to the destruction of the whole framework on which space law is based, the question arises whether from the practice of the very great majority of States one can conclude that a rule of customary law has already been found. From the discussions in the U.N. Committee the conclusion can be drawn that the practice of States is as yet not accompanied by a general belief that their conduct is based on an obligation of positive international law.

From these discussions it can however be concluded that the overwhelming majority of States are in favour of accepting a conventional rule by which the term outer space is defined as embracing the whole space at and above the lowest perigee of satellites put into orbit.

On page 7 of the Report, the question was put as to whether when fixing a boundary, a review mechanism should be provided for allowing possible adaptation to new scientific and technological developments.

Four members declared themselves in favour of such a mechanism. Professor *Cocca* suggested that when States intend modifying their criterion they should do so according to the traditional means without the need for a pre-established system.

Professor *Zhukov* referred to art. 39 of the Vienna Convention 1969, which provides that a treaty may be amended by agreement between the Parties and mentioned the possibility of fixing a *precise date* to discuss the question of the usefulness of amendment of the Treaty.

Professor *Maureen Williams* did not consider it advisable to include a review clause, unless only after the first five or ten years following the coming into force of the agreement. I may suggest that, as it will always be possible for States to modify the criterion adopted, it does not seem particularly difficult to arrive at a consensus on whether or not a pre-established review mechanism would be desirable.

The third question was worded as follows: Should special rules be elaborated for the flight of space shuttles during the first orbit after launching?

Three members consider such rules unnecessary, believing that they might create a dangerous precedent.

*Professor Bockstiegel*, though not possessing enough technical information on this issue, stated that in no case should the freedom of outer space be curtailed under any pretext.

*Professor Zhukov* considers that as the Space Treaty contains provisions qualifying the principle of freedom of outer space, there is nothing extra-ordinary if new rules regulated the use of any kind of space technology.

As to the fifth question whether an agreement on delimitation should contain provisions regarding the use of the geostationary orbit, four members did not see a need for such provisions.

*Professor Zhukov*, though considering that the general legal regime is applicable to these orbits, expressed the opinion that a consideration of this question either in connection with the same instrument or separately might not be excluded.

*Mr. Chowdhury* believes that there is a definite need for the formulation of norms regulating the use of this orbit and referred in this context to the benefit provision of the Space Treaty.

Referring to the crucial question whether air sovereignty should extend up to the height of the lowest boundary of outer space, with the exception of Professor Gorove, the other members answered this question in the affirmative. *Professor Gorove* believes however that the history of the space age so far appears to indicate that the international community of States has not in practice extended sovereignty up to the height of orbiting satellites. He thinks that at present there is no great pressure to clarify the status of this area and that it may be prudent to await technological devices to be ushered in by space transport systems before advocating a specific position. Later, I shall make some comments on this view.

On page 10 of the Report the question was asked whether members agreed that no spacecraft is allowed to penetrate in the airspace over which a State exercises sovereignty except by virtue of a bilateral or multilateral agreement.

In this context I referred in the Report to the opinion expressed in COPUOS by the Italian delegate according to which, if a limit between air-space and outer-space would be established, air space would automatically come under the Chicago Convention *alone*. I submitted that since this Convention - as the title clearly indicated - is solely concerned with international civil aviation, it could not be applied *qualitate qua* to space activities. The replies received from members of our Committee indicate that they rejected the opinion of the Italian delegate.

With regard to the crucial question of freedom of passage for spacecraft through foreign air space, the I.L.A. Resolution of Manila welcomed the growing support for the establishment of such a principle. Insofar as the Soviet proposal is concerned, according to which such right, regarding spacecraft returning to earth, is restricted to the *territory of the launching States*, the members considered such restriction to be undesirable. In this context one has to think in particular of the use of the space shuttle for transportation between countries.

As I mentioned, in the Manila Resolution it was recognized that the final formulation of a rule of freedom of passage should take into consideration the political and economic implications involved. In this context I should like to make some observations regarding the way the interests of the transit State may be affected by the passage of foreign spacecraft through their airspace.

In the first place the passage through the air space should be peaceful. One of the great difficulties here is that the opinions regarding the term "peaceful" in the context of space activities are strongly divergent. As is well known, the meaning of the term "peaceful" has sometimes been interpreted as "non-aggressive". Can one expect States to accept the principle that a rule of freedom of passage allows the passage of foreign military - though non-aggressive - spacecraft through their territorial airspace? It can hardly be expected that States would be prepared to grant such a general right. Consequently in the Draft Resolution it is suggested that freedom of passage should only be granted to non-military objects.

Apart from military considerations there are problems of an economic nature which, with the advent of space transportation are likely to arise.

In this connection it might be useful to look at the situation regarding transportation by *aircraft* through foreign airspace. A very large number of States have signed the *International Air Service Transit Agreement*. However, there are still several States which are of great importance from the point of view of transit of civil aircraft, but which as yet have not signed this agreement. They either consider that the granting of transit rights might adversely influence the interests of their own airlines or they want to obtain financial advantages by charging for such rights. From this practice, it can be concluded that - insofar as the operation of aircraft is concerned - no customary rule of freedom of transit has as yet been formed.

Can it be expected that insofar as *space transportation* is concerned, these States would be willing to accept a more liberal attitude? However much one may hope that the crucial need for international cooperation in this field may influence their attitude in a favourable way, there is one factor which in the field of *air transportation* has led to a considerable number of States to accept the principle of freedom of passage, but which - for a long time to come - will not play the same role in *space transportation*.

Whereas an ever increasing number of States are operating world air services for which a need for granting reciprocal rights of freedom of passage exists, only very few States will for many years to come, have the capability of performing space transportation. The very great disparities in the position of the Space Powers on the one hand and the *non-possidentes* on the other, will obviously have certain implications for the solution of the "freedom of passage" issue.

Coming back to the fundamental issue of drawing a boundary, an ever growing number of States consider the need of drawing a boundary between air- and outer space to be an urgent one. However, some doubts have been expressed on the *political acceptability* of drawing such a boundary *at the present stage*, but are these doubts justified? Would *any* national interest of States be put at risk through a conventional legal rule by which a boundary is definitely determined? When one takes the example of the use of a spacecraft for transportation between two countries, would an agreement on the extension of air sovereignty up to that height, enable States to exercise an authority over foreign spacecraft traversing this space, which they are not entitled to exercise *at the present moment*?

The great majority of States consider already *now* to have the right to exercise their sovereignty up to the limit where outer space begins. They have rejected any theory based on dividing that space above the earth in three zones. If States would consider the passage of a foreign spacecraft below the lowest perigee of satellites to affect their national interest - either from a security or economic point of view - they would even without a *formal* agreement on the height of air sovereignty, claim the right to prevent such passage.

The great advantage of establishing a boundary lies in the increase of legal security. Although it would of course not lead to an avoidance of *all* possible kinds of conflicts, it certainly would *limit* the chances of legal disputes arising in this field. One only has to think of claims like those made by the eight Equatorial States.

The one danger which should be avoided is that by delaying one's efforts to arrive at a consensus on a rule of positive international law, based on the principle that no State can claim sovereignty at or above the lowest perigee of satellites placed in orbit and further based on the principle that their air-sovereignty extends up to that height, a situation may arise comparable to that which has given rise to the critical conflicts on width of the territorial sea.

This morning the members of the Space Law Committee present, have had a discussion on the problems involved, agreed to submit a Draft Resolution\* which I may ask the President of the Conference to submit to you.

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\*For text of the Draft Resolution, see Current Documents, II, *infra*.

*(b) Final Remarks at the end of the Discussion*

From the discussions on the Draft Resolution the conclusion can be drawn that its text has received a considerable measure of support. I may be allowed to make a comment on the one reference in the Draft which has given rise to some doubts in the mind of *Professor Bakotic*, namely the reference to the study of the problem of a right of passage for non-military space objects.

In my introduction I mentioned the different interpretations given to the term "peaceful" in the context of space activities and I submitted that an interpretation of this term in the sense of "non-aggressive" might lead to the contention that military but non-aggressive spacecraft would be allowed to pass through foreign air-space. In the same way as States, on the basis of their sovereignty over air space, do not allow foreign military aircraft to pass through this space except for military spacecraft. In order to prevent any conflicts from arising in this field, the members of our Committee, who drafted the Resolution, considered it important to stress that a right of freedom of passage should only be granted to non-military spacecraft.

Prof. Dr. D. Goedhuis  
Chairman of the Space Law Committee  
of the I.L.A.

*2. Symposium on "Satellites, Space and International Law". Annual Convention of the Federal Bar Association. Washington, D.C., August 27, 1980.*

The Aerospace Law Committee of the Federal Bar Association (FBA) sponsored a symposium on Satellites, Space and International Law on August 27, 1980, as part of the Federal Bar Association's annual convention in Washington, D.C.

Judge Harold Berger of Philadelphia, Committee Chairman, acted as moderator and delivered a paper on solar satellites. Eileen Galloway, an internationally recognized scholar in the space law field, and General Martin Menter, President of the Association of the United States Members of the International Institute of Space Law (IISL), delivered papers on the Moon Treaty. S. Neil Hosenball, NASA General Counsel, elaborated on steps NASA was taking to manage tort liability risks in the Space Shuttle era. Professor Stephen Gorove, of the University of Mississippi Law Center, and Vice President for Programs of the U.S. members of the IISL discussed the Solar Power Satellite (SPS) system.

The symposium concluded with a statement by Gerald J. Mossinghoff, NASA Deputy General Counsel, on the interaction of U.S. activities in several multinational organizations.

Judge Harold Berger  
Chairman, FBA Aerospace  
Law Committee

3. *The 28th Colloquium on the Law of Outer Space, Tokyo, Japan, September 21-28, 1980.*

The Twenty-Eighth Colloquium on the Law of Outer Space took place during the XXXIst Congress of the International Astronautical Federation in the Takanawa Prince Hotel in Tokyo, Japan, September 21-28, 1980.

The Colloquium was attended by lawyers from the United Nations, the United States, Japan, the Western and Eastern European countries, Indonesia, India and Mexico. There were four official subjects on the Colloquium's agenda: 1) Implications of the Agreement Governing the Activities of States on the Moon and Other Celestial Bodies; 2) Implications of the World Administrative Radio Conference 1979 (WARC); 3) Protection of the Environment: Earth, Celestial Bodies and Outer Space; 4) Patterns of International Space Cooperation (international regimes applicable to space activities; regime for international manned flight and other space applications).

During the general discussion following the presentation of papers on the first subject, namely Implications of the Agreement Governing the Activities of States on the Moon and Other Celestial Bodies, which was chaired by Prof. Kuribayashi of Japan, Dr. Fasan expressed the view that there existed no definition of a celestial body. Art. 1, par. 3 of the Moon Agreement did not apply to extraterrestrial material. He asked the question if a meteorite or an asteroid was a celestial body or not. Furthermore, he raised the question of the meaning of exploration and use, and also of self-supporting constructions. These are not to be considered as exploration but as industrial exploitation. Dr. Fasan also raised the problem of the type of regime for exploitation, that is whether we needed an ICAO-type or an Intelsat-type of exploitation.

Eilene Galloway having studied the Moon Treaty *ad fundum* made a solid comment. She observed that equitable sharing was not to be considered as equal sharing.

Dr. Padang made comparisons with the law of the sea. He stressed Art. 11 of the Moon Treaty: when the time comes the regime should take into account those States that contributed to the exploration and exploitation of the moon. Dr. Haanappel thought that there were common principles between space and sea law.

Mr. Quadri thought that the Moon Treaty was a pure repetition of the Treaty of 1967.

Mr. Jasentuliyana observed that the concept of *res communis omnium* was an abstract idea. The real problem of space law was to lay down in clear terms the limitation of space activities. The basic problems were liability and insurance, not ownership of the moon.

Papers on the second subject under the chairmanship of Prof. Diederiks-Verschoor included presentations by R. W. Norris and R. Bridge (U.S.A.) on the Moon Treaty and papers by Prof. T. Kosuge (Japan), R. F. Stowe (presented by Gen. M. Menter) and of K. Kumar (India) on Telecommunications. A vivid discussion followed on the implications of WARC 1979. Prof. Gorove noted a tendency away from the "first come, first served" principle: a victory for the less developed countries (LDCs). He also noted changes between the 1973 I.T.U. Convention and the 1979 W.A.R.C. resolutions in respect of the "equitable access" principle. Following the trend in Prof. Kosuge's paper, Prof. Gorove wondered whether "channel allocation", to be considered by W.A.R.C. 1984, would constitute "national appropriation" in the sense of Article II of the Outer Space Treaty.

Upon a question by Gen. M. Menter, Prof. Gorove answered that whether there will be any channel allocation planning, is a decision to be taken by W.A.R.C. 1984. Which way that decision will go in 1984, may not be too hard to predict in view of the weight of the votes of the LDCs.

Mr. N. Jasentuliyana observed that LDCs do not possess the necessary technology to judge their needs for radio communication frequencies in the geostationary orbit. Therefore their attitude is to ask for the setting aside of as many frequencies as possible. What would be needed is transfer of technology from the developed nations to the LDCs, so that these latter countries can better evaluate what their true needs are.

As a comment upon Mr. Kumar's presentation, Dr. Perek noted that the Soviet Molnyia system is another alternative to geostationary satellites. Mr. Kumar replied that even so there would be a serious overcrowding problem in the equatorial geostationary orbit.

After these discussions on W.A.R.C. 1979, the Chairperson gave the floor to Dr. Hernandez for the presentation of his paper. Thereafter the discussions returned to the subject of the Moon Treaty. Upon a question by Prof. Gorove, Dr. Fasan noted that the concept of "mankind" in the Moon Treaty is a new legal notion, on its way to receiving a separate and independent legal personality. Upon a further question by Prof. Gorove, Dr. Fasan stated that "mankind" is to be understood as mankind on earth only, *not* including possible extraterrestrial human life. Ms. Sterns disagreed on this point and expressed the view that the notion of "mankind" should include extraterrestrial forms of life.

Upon a question by Prof. Quadri, Dr. Fasan stated that "mankind" as used in the Moon Treaty is more than the sum of nation States; it is a new legal person, a legal subject. Prof. Y. Kolossov then came with the follow-up question, who would be the spokesman for this new legal person. Dr. Fasan acknowledged the question as a good one and answered that it is still too early to tell who that spokesman will be. Chairperson Diederiks voiced the opinion that "mankind" has its spokesman through individual States. Dr. Padang noted that "mankind" as used in the Moon Treaty is for the time



being a philosophical and not as yet a legal concept, to be understood in the narrow sense of the Treaty. Prof. Gorove then noted that the Moon Treaty nevertheless takes us a step further to knowing what "mankind" means. The Outer Space Treaty only used the very vague term "province of all mankind", whereas the Moon Treaty also used the more concrete concept of "common heritage of mankind".

Gen. Menter suggested to terminate discussions on the Moon Treaty for the day and to move into the General Assembly of I.I.S.L. members. The Session Chairman agreed and Prof. Quadri made a closing remark on "province" and "common heritage" of mankind, suggesting to replace them by speaking simply of "freedom" of the Moon and celestial bodies.

The third session was devoted to the subject Protection of the Environment: Earth, Celestial Bodies and Outer Space, and was chaired by Dr. Vereshchetin. During the discussion Dr. Kolossov asked if the European Space Agency, an organization the charter of which entered into force on October 30, 1980 was a party to the outer space conventions. Dr. Bourelly answered that the ESA was a party to the 3 first conventions. Dr. Kolossov observed further that the "common heritage of mankind" was not a principle but more a part of international law. Dr. Fasan asked if harmful contamination would fall under the Liability Convention. Dr. Kolossov answered in the negative. Prof. Haanappel mentioned that the last sentence of Art. 18 contained the "common heritage of mankind" as a principle. It was not a principle in Art. 11 but it was hidden in Art. 18. Dr. Vereshchetin was of the opinion that the common heritage was a philosophical principle not a negotiating principle.

During the fourth session which was chaired by Dr. Menter comments were given on the subject matter Regime for International Space Cooperation.

Dr. Safavi of Iran related deficiencies he found in the newly proposed Moon Treaty. He recommended three areas for study: 1) As definitions are part of and clarify an agreement, the terms used, such as "peaceful use", among others should be defined; 2) we should determine what sanctions should be applied for violation of the Treaty as none is presently prescribed; and 3) while the Space Shuttle is in airspace it will be covered by the "Tokyo Convention" governing commission of crimes occurring aboard aircraft but unsettled is the situation when a crime is committed aboard the Shuttle while it is in outer space.

Prof. Kolossov of the USSR observed that several colleagues had noted the need for study of the legal situation arising from private enterprise undertaking commercial activities in outer space. He related his opinion that as Governments were internationally responsible for all national activities in space, a positive responsibility rested at the national level to provide legislation and rules governing and supervising private entities in outer space: further, he said that international rules were perhaps not necessary as members of the international community would look to resolve at the governmental level any international problem growing out of activities of private entities in outer space.

Prof. Gorove believed that the point brought up by Dr. Kolossov had some interesting ramifications worthy of consideration. He pointed out that under Article VI of the Outer Space Treaty activities of nongovernmental entities in outer space required authorization and continuing supervision by the appropriate State party. There were at least two questions which might be raised. The first one was whether or not nongovernmental entities could legitimately conduct space activities if the state had prescribed no specific procedures for authorization or supervision. More precisely, the question was whether such entities could legitimately undertake activities in outer space without first requesting the government's approval if there were no laws, other than the Treaty obligation. In other words, if no specific domestic regulations have been promulgated by the State party regarding authorization and supervision would it nonetheless be incumbent upon such entities to request authorization and supervision in each case when they plan to conduct activities in outer space? Put it differently, are such entities to request authorization and supervision in each case when they plan to conduct activities in outer space? Are such entities put on notice by virtue of Article VI and, if so, could the State prosecute and punish them if they have not done so? Presumably, the answer to this question would be in the negative in the United States, and most likely also in other countries, largely because even if Article VI is construed as an obligation imposed not only on states but implicitly also on nongovernmental organizations, it is likely to be regarded by the courts as an imperfect legislation without specific penalty.

The second question according to Prof. Gorove was what recourse, if any, could other States parties to the Outer Space Treaty have against a State which had failed to enact laws and issue regulations governing authorization and supervision of *all* nongovernmental activities in outer space. Of course, if there is some injury or damage to other States or their nationals, international responsibility would clearly apply. But the question is what action could States take if there is no such injury or damage but only a technical nonfulfillment of the obligation regarding authorization and continuing supervision. This is an important question particularly because, countries in which nongovernmental entities may conduct space activities, up to now, appear not to have enacted laws or issued regulations governing authorization and continuing supervision of *all* activities in outer space that could be conducted by any nongovernmental entity.

The Session Chairman related that the language of Article VI was taken from a principle contained in Resolution 1962 adopted by the UN General Assembly in December 1963, which was proposed by the USSR. This principle is repeated in the Treaty on the Moon, which looks to States undertaking the establishment of an international regime to govern exploitation of the moon's natural resources. Thus, Dr. Menter felt that a dual responsibility is envisaged over private entities engaged in space activities—that of the international community establishing guiding principles, if not regulations, and the supervision of a State to assure that its responsibilities (and that of its nationals) under treaties and its own legislation and regulations are observed. While a fixed definition of the supervision required under Article VI was believed not

forthcoming, States would be expected to vest responsibility in named governmental agencies which would issue governing rules and regulations and procedures in conformance with the States legislation and the applicable treaties and to have inspections and/or investigations to assure compliance.

While enacted prior to Article VI of the 1967 Outer Space Treaty, the COMSAT legislation enacted in 1962, perhaps may be cited as an example. Here the Act imposed upon the Department of State certain responsibilities in relation to foreign governments, other responsibilities in NASA in relation to COMSAT and further responsibilities in the Department of Commerce. The observation was further made that there was hardly any corporate structure in the United States today that was not subject to some regulatory control.

Dr. Robert Woetzel of USA observed that the Code of Conduct proposed for transnational corporations entails obligations under which criminal penalties may attach to individuals and corporations.

The Session Chairman related that the present legislative proposals for restatement of the U.S. Criminal Code include provisions to extend U.S. criminal jurisdiction to offenses occurring in outer space. While criminal law committees of both houses of Congress have favorably reported versions of the proposed Code, it was doubtful that enactment could occur during the short remaining time of the present Congress. However, note should be taken of the regulation published this past March by the NASA Administrator vesting "absolute authority" in the Space Shuttle Commander to control discipline aboard the Shuttle. This regulation was issued under authority of the 1958 NASA basic act and violation of the Shuttle Commander's orders, under the present US Criminal Code, would subject the offender to possible confinement of one year, or fine of \$5,000, or both.

Mrs. Eilene Galloway of USA related that Presidential Executive Orders in implementing the COMSAT Act provided more detail as to the role of the State Department and interdepartmental coordination regarding space communications. It is inevitable that the Government will play a larger role as NASA launches the satellites. Private industry probably never will because of the high cost.

The Session Chairman remarked that persons who attended the OTRAG briefing this week may recall that OTRAG, a private German corporation anticipates selling within a couple of years the launching of payloads into Earth orbit. Launchings are contemplated from Libya.

Dr. Patricia Sterns of USA remarked that continuing supervision of private activities in space will become a necessity for self preservation to reduce the possibility of conflict and for governments to know the types of liability they may be subjected to; thus, there should not really be a problem, although various systems of supervision by different governments may be employed. Dr. Sterns also stated her belief that the Moon

Treaty will increase the potential for space activities in spite the scare tactic arguments against the Treaty made by organizations such as the L-5 Society.

Mr. Fred Osborn of the USA an observer attending the IISL Space Law Colloquium, stated his belief that the public debate within the United States on the Moon Treaty was brought on by the L-5 Society and is a good thing which will allow more citizens to understand the issues and to make inputs to their elected representatives.

The Session Chairman, in concluding the discussion period, thanked the Session speakers for the presentation of their papers and the floor discussants for their participation. He further noted that the U.S. Senate Committee on Commerce, Science and Transportation recently had held a two day Hearing on the Moon Treaty. Preparatory to the Hearing, the Committee requested Mrs. Eilene Galloway, the Office of Technology Assessment of Congress and the Congressional Research Service to undertake a background study of the Treaty for the information of the Committee. At the time of the Hearing, only Mrs. Galloway's analytical report, comprising Parts I and II of the four part study, had been published. Part I contains a section by section comparative analysis with the space treaties now in force and with other related documents. Part II consists of the texts of the Treaty on the Moon and other international documents important to an understanding of the Moon Treaty. Both parts comprise a 265 page document, which is available from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402, at \$5.50 per copy.

After the last session the Colloquium was closed by the President who expressed warm thanks to the Japanese hosts and stressed that even if the number of participants was a little less than usual because of the distance, the Colloquium had been a real success in view of the quality of papers and the valuable exchange of thoughts.\*

Prof. Dr. I.H.Ph. Diederiks-Verschoor  
President of the International  
Institute of Space Law (IAF)

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\**Editor's note* It may be of interest to note that the Annual Assembly of the IISL membership unanimously approved a Resolution for transmission by the IISL President to the UN Secretary General urging resumption of Summary Records of COPUOS Subcommittees. It is possible that this Resolution may have been instrumental in the resumption of Summary Records of the Legal Subcommittee decided subsequently by the UN General Assembly.

*4. Symposium on Space Activities and Implications, Centre for Research of Air and Space Law, McGill University, Montreal, Oct. 16-17, 1980.*

The Centre for Research of Air and Space Law at McGill University, Montreal, Canada, held a Symposium on "Space Activities and Implications: Where From and Where To at the Threshold of the 80's", on October 16 and 17, 1980.

In April 1979, the Social Sciences and Humanities Research Council of Canada entrusted the Centre for Research of Air and Space Law (the Research arm of the Institute of Air and Space Law) with a 4-year research project on "Space Activities and Emerging International Law". Organized within the framework of this 4-year project, this Symposium succeeded in mingling together experts of various disciplines. The two days were divided into 4 panels, following a chronological review of the space activities and their problems. All through the sessions, engineers, geographers, economists, political scientists and lawyers presented their points of view and exchanged, for the benefit of the audience, their specific knowledge, much too often unknown to each other.

The first panel on the "Inventory of Space Activities" was opened by Michael Collins, astronaut on the Apollo 11 mission; the next two panels dealt with "Present Use and Regulations of Space", especially the way "Common Heritage of Mankind" was served. The last panel on "The Future of Space Activities and Implications" tried to forecast the development which can be expected mainly from the Space Shuttle and the European involvement with the ARIANE launcher.

The most innovative input certainly came from the economists. Professors Wihlborg and Wijkman proposed the concept of international condominium for the exploitation of the common heritage of mankind. A clear note of scepticism as to the performance of the United Nations in regulating the field emerged from this meeting, and it seems that new specialized agencies should take care of the management and regulations of space activities. At the closing banquet the Minister of Communications of Canada, the Honorable Francis Fox himself, sent some criticism towards the slow moving COPUOS. Also, other eminent speakers were present: Mr. Gibson, former Director of ESA and former president of the IAF; certainly the lawyers dominated in number with well known specialists like Mrs. Diederiks-Verschoor, President of the International Institute of Space Law; Neil Hosenball, General Counsel of NASA; Professor Bockstiegel from Germany; Professor Christol from the U.S.A.; Professor Mircea Mateescu-Matte from France; Mr. Jasentuliyana from the U.N.; M. Bourelly from ESA, and many others.

Thanks to the participation of around one hundred persons coming from all parts of the world, the discussions following each panel were of an excellent caliber.

The proceedings of this Symposium will appear early in 1981 for the benefit of the law libraries and researchers who were not able to attend. In view of the success

achieved, the Director of the Centre, Nicolas Mateesco Matte, will convene in October 1981 a Symposium on: Earth-oriented Space Activities and Legal Implications. We are assured that, if the quality of organization and panelists remains as good as it has been this year, the new Symposium will be most interesting.

Jean-Louis Magdelenat  
Assistant Director, Centre  
for Research of Air and Space  
Law, McGill University

*5. Session of the AALS Section of Mass Communications Law on the Future of International Communications, San Antonio, Jan. 4, 1981*

During the Annual Meeting of the Association of American Law Schools (AALS), the Section on Mass Communications Law held a meeting on "The Future of International Communications: Legal and Policy Issues" in San Antonio, Jan. 4, 1981.

The meeting noted that communications issues were appearing with increasing frequency before numerous public international organizations, including the International Telecommunication Union, UNESCO and other UN-affiliated bodies, and organizations outside the UN's auspices, such as the Organization for Economic Cooperation and Development. The program focused on major issues which were before the 1979 WARC, examined some of the controversial issues which were addressed in the recent "McBride Report" issued by UNESCO's International Commission for the Study of Communications Problems and also examined the manner in which U.S. decision making process operates in relation to international communication policy. Participants and discussants included: Carol Lee Hilewick, Office of International Communications Policy, U.S. International Communications Agency; Anthony Rutkowski, Office of Science and Technology, Federal Communications Commission; George Haimbaugh, University of South Carolina Law School; David Rice, N.Y. Law School (moderator); and Stephen Gorove, University of Mississippi Law Center.

Stephen Gorove  
President, Ass'n of the U.S.  
Members of the International  
Institute of Space Law (IAF)

*6. Other Events*

During the Annual Meeting of the Association of American Law Schools held in San Antonio, Texas in addition to the session of the Section on Mass Communications Law, noted above, the Section on Aviation and Space Law also held a brief business meeting and discussed air law problems.

### 7. Brief News

As a result of collaboration between the European Organization for Nuclear Research (CERN), the Commission of the European Communities (CEC) and the European Space Agency (ESA) a new European experimental system (STELLA) was inaugurated earlier this year for the high speed transmission of scientific data by satellite between various parts of Europe. . . On October 30, 1980 France deposited its instrument of ratification of the Convention for the Establishment of a European Space Agency (ESA), thus completing the legal formalities required for the Convention's entry into force. Although the countries which had signed the Convention on May 30, 1975 had agreed to apply its provisions immediately—which has enabled ESA to operate "*de facto*" for more than 5 years—the political importance of the formal entry into force should not be underestimated. . . The Space Shuttle is expected to be launched in late March or April 1981, if everything goes according to schedule. . . Under a European project, to be known as "Giotto", a scientific spacecraft is to explore Haley's Comet in 1986.

#### B. Forthcoming Events

The 1981 Pacific Telecommunications Conference to be held on January 12-14 in Honolulu is expected to discuss *inter alia* current international telecommunication policies, issues, the law of international information networks and the social effects of telecommunications.

The Fifth International Conference on Digital Satellite Communications is scheduled to meet in Genoa, Italy, March 23-25, 1981.

The Second AIAA Conference on Large Space Platforms: Toward Permanent Manned Occupancy of Space will be held in San Diego, California, on February 2-4, 1981. The Conference is expected to provide a Historical Overview and also discuss some of the Legal, Institutional and International Issues in addition to the technical aspects.

A Symposium on Military Space Doctrine will be held at the U.S. Air Force Academy, in Colorado, April 1-3, 1981. The Symposium is to evaluate current space policy and investigate new concepts for future military space doctrine. Requests for registration, etc. should be addressed to "Dept. of Astronautics & Computer Sciences, USAF Academy, Colorado 80840 (Att'n: Maj. Gene Justin, USAF).

A "Space Law Workshop" focusing on the Space Shuttle is expected to be held on April 24, 1981 during the Annual Meeting of the American Society of International Law in Washington, D.C.

The 24th Space Law Colloquium will be held during the XXXIInd Congress of the International Astronautical Federation in Rome, Italy, on September 6-12, 1981. Subjects to be discussed include: 1) Legal Implications of Economic Activities in Space; 2) Legal Status of Artificial Space Objects; 3) Legal Implications of Space Transportation Systems; and 4) Institutional Arrangements for Space Activities.

*The Space Shuttle and the Law*, by Stephen Gorove (ed.), L.Q.C. Lamar Society Monograph Series No. 3, University of Mississippi Law Center, 1980, pp. 133.

The publication of "The Space Shuttle and the Law" by Professor Stephen Gorove of the University of Mississippi Law Center provides a significant contribution to the understanding of legal and policy considerations associated with operating the Space Transportation System of the 1980's and beyond. The Space Shuttle will provide whole new opportunities in space and accordingly requires that thoughtful consideration be given to issues which may affect its full potential.

The success of the Space Shuttle and, in the broader sense, the ultimate benefits which can be obtained from future space operations will depend on aggressive national as well as international space programs and, increasingly, on the involvement of non-government enterprises. Legal regimes established during the first twenty years of space provided the basic principles which have fostered the growth and use of spaceflight and the development of new technologies. Mankind has indeed benefited from international recognition of free access to space and the use of space for peaceful purposes. In the new era of Space Shuttle, routine flights and expanding and varied activities in earth orbit will characterize space operations. It must be assured that no unnecessary limitations or artificial barriers exist which would inhibit continued progress. Space law is rapidly expanding into areas of general law incorporating principles affecting human conduct and business practices as well as international agreements. "The Space Shuttle and the Law" addresses many of the issues and delineates conditions and standards which will be applied. The compilation of papers form the basis for useful dialogue and deserve careful attention from the legal community and others involved in developing space policy.

Don Fuqua  
Chairman, Committee on Science and Technology  
U.S. House of Representatives

*Space Policy and Programmes Today and Tomorrow: The Vanishing Duopole*, by Nicolas Mateesco Matte, Institute and Centre of Air and Space Law, McGill University (Montreal) 1980, pp. 183.

The author, who is the Director of the Institute of Air and Space Law in Montreal, is to be congratulated for this very timely and useful contribution to the literature on space law and policy.

The author describes the programmes carried out or planned by the US and the USSR and discusses their advantages and drawbacks, analyzing at the same time, the space policies which inspired such programmes. He discussed critically the legal regime which governs these activities, offers a new direction for the future and identifies a number of areas which require legal regulation. The book contains 50 pages of annexes which include the texts of space policy and programme pronouncements by the leaders of the United States, the Soviet Union and the European Space Agency which are not otherwise available.



The central theme of the book is that the two major space powers-the US and the USSR-have hitherto dominated space policy and programmes but that with the increasing involvement of other industrialized states of Europe, Canada and Japan, as well as some of the developing countries in space activities, the dominant influence of the duopole is being diminished.

In substantiating this thesis, the book traces the development of the space programmes of the Soviet Union and the United States, as well as those of other countries involved either individually or cooperatively in space activities.

The beginnings of the Soviet Union's space programme are traced to the work of space enthusiasts who developed rocketry with the encouragement and official support of the Bolshevik revolution which emphasized scientific advancement and technological development as necessary tools in the construction of the new society. The programme's development is then traced through the launching of Sputnik I to the more recent formulation of international cooperative programmes with the other socialist countries. Looking toward the future, the author suggests that the USSR will continue building mainly practical earth-oriented multi-purpose projects in cooperation with the socialist and non-socialist states.

The origin of the US programme is traced to space enthusiasts, like Robert Goddard who unlike his counterparts in the USSR, developed rocketry without official governmental support. This was due to the US government's belief that such support was not warranted based on the conclusion of the US military that space research held no military value. The involvement of the United States military is traced to the jolt it received from the launching of Sputnik I. As a result, space research in the US began to receive governmental support during the Eisenhower period. The development of the civilian space programme is traced to the commitment of President Kennedy to land a man on the moon and the consequent creation of NASA. The expansion of the civilian programme, particularly as a result of the cooperative efforts undertaken with other countries which culminated in the formation of INTELSAT, are chronologically documented in the book. Looking to the future, the author suggests that the US programme will have limited goals and concentrate on the Shuttle programme with emphasis on international cooperation. The author notes that, above all, budgetary policies are determining present and planned US space programmes, and he calls for a more inspired space policy which is not guided by financial considerations. Matte endorses the view that "if cost-benefit rates had governed our history, Socrates would have become a babysitter, Newton an apple polisher, Galileo and Giordano Bruno court jesters, and Columbus would have taken out a gondola concession in Venice".

In looking at the US and the USSR space programmes, the author feels that they were inspired by policy decisions which developed through three stages. In his view, during the first stage of space exploration (1957-1961), space policy was dominated by Cold War issues and was enmeshed in a confusion of peaceful, military, and security considerations. The second stage (1961-1969) saw the extension of space exploration to

commercial utilization which was the result of rationally minded policies. During this time, international cooperative efforts were also begun, but the US and the USSR continued to dominate policy issues, including the formulation of international law relating to space activities. The third stage (1969-1979) is marked, in the authors' view, by the vanishing of the duopole. During this period, industrialized states have sought and acquired space technology nationally or regionally through, for example, the European Space Agency (ESA). The developing countries that had benefited passively in the past now desired to participate actively and joined the international community in seeking a definition of a policy of freedom of space exploration and use for the benefit of all mankind in the spirit that space and its resources are the "common heritage of mankind". Matte feels that these developments now required the revamping of the established space policies.

In his view, international space law is an important tool which assists in the formulation of space policy and in giving direction to space programmes. He, therefore, traces the development of international space law agreements in the United Nations, including the dominance of the US and the USSR over their formulation. For example, in the view of the author, the Outer Space Treaty, which was adopted in 1967, "is no more than a compromise between the two great powers in the nature of an appeasement of world opinion, which was concerned with the deterioration of relations between the two blocs and the consequences to international peace of the antagonism between the United States and the Soviet Union over the Vietnam War". In his view, "the Treaty represents an international agreement tailored to the needs and wishes of the US and the USSR". Matte feels that subsequent international agreements were also tailor-made to suit the needs of the US and the USSR, but that as other countries became interested in space activities, there was a change in the process but the US and the USSR continued to influence the formulation of space law.

The author suggests that space activities develop so rapidly that emerging law becomes obsolete before it can be implemented. As a result, such law is often inadequate for regulating technology, or economic or political changes and there is an urgent need for a revitalized legal regime to cope with the fact that space is becoming an integral part of life on earth. In this connexion, Matte points out the need for effective international space agreements within the framework of a new Economic Order, particularly in order to deal with the activities of private enterprises which the author feels should be brought in to assist in the sharing of the economic benefits of space exploration in such areas as remote sensing, solar power systems and space industrialization. In his view, future space ventures should be both commercialized and internationalized at the same time.

The author calls for the US and the USSR to adjust and integrate their national policies into a "regional, and, later, a world-wide policy for a corresponding space order". He makes a plea for a civil space policy that will promote co-existence and

detente between the space powers and the gradual transfer of military technology into civil use, for otherwise, he says, there could only be "eternal silence".

N. Jasentuliyana  
Outer Space Affairs Division,  
United Nations Secretariat

*Toward the Endless Frontier: History of the Committee on Science and Technology, 1959-79*, prepared by Ken Hechler, United States House of Representatives (Committee Print, 1980.), pp. 1073.

Many people have often wondered what goes on inside the halls of Congress, especially the workings of the various committees. Thanks to the Committee on Science and Technology's decision to have its history written and published, a better understanding of the Committee's affairs is now available. *Toward the Endless Frontier* is a comprehensive account of the history of the Committee and the problems faced by it, including the conflicts between the individual members, the problems encountered under the various chairmen, the negotiations with the White House and NASA officials, and the problems in establishing international cooperation.

The book does have some significance in regard to international space law because it discusses some of the international agreements including the Outer Space Treaty of 1967. The study also traces the NASA Act of 1958 the purpose of which was to assure the peaceful exploration of outer space and to seek international agreements for joint exploration of space, as well as joint cooperation in scientific developments.

Although the book is not directed to problems of space law it is of significance in providing an insight into the whole picture of the space program as it was perceived by the Committee whose reasoning and decisions have influenced every aspect of our space activity.

*Space Manufacturing Facilities-3* (Proceedings of the Fourth Princeton AIAA Conference, May 14-17, 1979), edited by Jerry Grey and Christine Krop (Am. Inst. of Aeronautics & Astronautics, 1980), pp. xi, 574.

*Space Manufacturing Facilities-3* compiles a series of presentations made at Princeton University in May 1979. Representing the most recent of three conferences on space technology, this volume deals primarily with scientific developments, priorities, and prospects. In addition, it also touches upon international, public, economic, environmental, and social considerations.

Addressing public policy, some seemed optimistic in assessing public attitudes toward space development, but most perceived public sentiment as cautious. Concerning legal progress, it was suggested that the law should not simply wait for problems of space habitation to arise but should anticipate and address such problems.

While technological developments toward space habitation were of primary interest, social considerations, such as status symbols, communications, and community aesthetics were viewed as having been insufficiently considered. Insofar as environmental control in relation to space exploration was concerned, possibilities available or in the planning stages were pointed out as being dependent on an evaluation of priorities.

*Space Manufacturing Facilities-3* is valuable in that it deals with technological developments and considerations which are, with time, the catalysts for legal and social developments. This volume's coverage furthers interdisciplinary thought.

## A. Books

- K. H. Böckstiegel (ed.), *Settlement of Space Law Disputes* (C. Heymanns Verlag, Köln, 1980).
- F. Fernandez-Shaw, *La Diffusion International de los Programmas Audiovisuales* (Editorial Tecnos, 1980).
- S. Gorove, *Satellite Power Systems (SPS)—International Agreements* (DOE/NASA, 1978).
- S. Gorove (ed.), *The Space Shuttle and the Law* (L.Q.C. Lamar Soc'y Monograph Ser. No. 3, University of Mississippi Law Center, 1980).
- J. Grey and C. Krop (eds.), *Space Manufacturing III—Proceedings of the Fourth Princeton/AIAA Conference May 14-17, 1979* (AIAA, 1979).
- J. Looney, *Bibliography of Space Books and Articles from Non-Aerospace Journals: 1957-1977* (NASA, 1979).

## B. Articles

- Ambrosetti, *Relevance of Remote Sensing to Third World Economic Development: Some Legal and Political Aspects*, 12 N.Y.U.J. Int'l. L. & Pol. 569 (1980).
- Bridge, *International Law and Military Activities in Outer Space*, 13 Akron L. Rev. 649 (1980).
- Bueckling, *Das Menschheitssyndrom im Weltraumrecht und das Konsensusprinzip*, 34 Monatsschrift für Deutsches Recht (Heft 8/1980).
- Christol, *International Liability for Damage Caused by Space Objects*, 74 Am. J. Int'l. L. 346 (1980).
- DeSaussure, *The New Era in Outer Space*, 13 Akron L. Rev. 593 (1980).
- Diederiks-Verschoor, *The Operator's Liability With Regard To Transport of Goods by Space Shuttle*, 13 Akron L. Rev. 689 (1980).
- Dula, *Space Law for Business Planners*, 7(3) J. Contemp. Bus. 113 (1978).
- Finch, *Outer Space Liability: Past, Present and Future*, 14 Int'l Law. 123 (1980).
- Fuqua, *Space Industrialization: Some Legal and Policy Considerations for Private Enterprise*, 8 J. Space L. 1 (1980).

- Gorove, The World Administrative Radio Conference 1979: Some Legal and Political Implications, 29 *Zeitschrift f. Luft- und Weltraumrecht* 214 (1980).
- Haga, INMARSAT: An Example of Global International Cooperation in the Field of Telecommunications, 47 *Telecommunications J.* 511 (1980).
- Jaksetic, Peaceful Uses of Outer Space: Soviet Views 28 *Am. U. L. Rev.* 483 (1979).
- Kreindler, Satellite Insurance, 183 *N.Y.L.J.* 1 (1980).
- Kries (von), Neuere Entwicklungen bei internationalen Weltraumorganisationen, 29 *Zeitschrift f. Luft- und Weltraumrecht* 221 (1980).
- Lay, Space Law: A New Proposal, 8 *J. Space L.* 41 (1980).
- Leaphart, Introduction to Space Law, 52 *N.Y. State Bar J.* 19 (1980).
- Martin, Legal Ramifications of the Uncontrolled Return of Space Objects to Earth, 45 *J. Air L.* 457 (1980).
- Menter, STS—Legal Connotations, 13 *Akron L. Rev.* 629 (1980).
- Michaud, The Anti-Satellite Program a Threat to Space Humanization? 1 *Space Humanization Ser.* 81 (1979).
- Preuschen (von), The European Space Agency, 27 *Int'l & Comp. L. Quart.* 46 (1978).
- Reed and Norris, Military Use of the Space Shuttle, 13 *Akron L. Rev.* 665 (1980).
- Robinson, Private Management's Operation of the Space Shuttle; Some Legal Problems Related to Market Entry, 13 *Akron L. Rev.* 601 (1980).
- Rothblatt, International Liability of the United States for Space Shuttle Operations, 13 *Int'l. Law.* 471 (1979).
- Rutkowski, The 1979 World Administrative Radio Conference: The ITU in a Changing World, 13 *Int'l. Law.* 289 (1979).
- Sloup, Current Status of NASA Space Shuttle Regulations, 13 *Akron L. Rev.* 623 (1980).
- Smith, The Moon Treaty and Free Enterprise, 18 *Astronautics and Aeronautics* 62 (1980).
- Sondaal, The Current Situation in the Field of Maritime Communication Satellites: INMARSAT, 8 *J. Space L.* 9 (1980).

St. James, The Legality of Antisatellites, 3 B. C. Int'l. and Comp. L. Rev. 467 (1980).

Thoma and Greiffenhagen, ESA's New Contract Regulations—An Instrument for Industrial Policy, 22 ESA Bull. 70 (1980).

Wolcott, Some Aspects of Third Party Liability in Space Shuttle Operations, 13 Akron L. Rev. 613 (1980).

#### Book Reviews/Notices

Gorove, S., Studies in Space Law: Its Challenges and Prospectives (L. C. Green), 16 Can. Yb. Int'l. L. 447 (1978).

Jasentuliyana, W. and Lee, R. S. K., Manual on Space Law (P.P.C. Haanappel), 6 Syr. J. Int'l. L. & Comm. 323 (1978).

Matte, N. M. and DeSaussure, H. (eds.), Legal Implications of Remote Sensing From Outer Space (C. S. Tang), 25 McGill L. J. 129 (1979).

#### C. Official Publications

##### *Agreements*

Agreement Relating to the International Telecommunications Satellite Organization (INTELSAT), with Annexes, Accessions Deposited at Honduras and Guinea May 6 and July 14, 1980. Entered into force February 12, 1973.

Convention on International Liability for Damage Caused by Space Objects, Accessions Deposited Syria Feb. 6, 1980, Trinidad and Tobago Feb. 8, 1980. Entered into force September 1, 1972.

Convention on Registration of Objects Launched Into Outer Space, Ratification Deposited, Austria, March 6, 1980.

Operating Agreement Relating to the International Telecommunications Satellite Organization (INTELSAT), with Annexes, Signed at Honduras and Guinea May 6 and July 14, 1980. Entered into force February 12, 1973.

##### *European Space Agency*

Annual Report-1979 (1979).

##### *Food and Agriculture Organization*

Report of Second Expert Consultation on a World Index of Space Imagery (1980).

*International Telecommunications Union*

Nineteenth Report by the International Telecommunication Union on Telecommunication and the Peaceful Uses of Outer Space (Geneva, 1980).

*United Nations*

U.N. General Assembly, Off. Rec., Report of the Comm. on the Peaceful Uses of Outer Space, 35th Sess., Doc. A/35/20 (Supp. No. 20, 1980).

U.N. General Assembly, Off. Rec., Report of the Preparatory Comm. for the Second U.N. Conference on the Exploration and Peaceful Uses of Outer Space, 35th Sess., Doc. A/35/46 (Supp. No. 46, 1980).

U.N. General Assembly, Comm. on the Peaceful Uses of Outer Space, Annual Report of the International Astronautical Federation to the United Nations Committee on the Peaceful Uses of Outer Space, on the Current State of Space Technology, Doc. A/AC.105/274 (1980).

U.N. General Assembly, Comm. on the Peaceful Uses of Outer Space Report on the United Nations Food and Agriculture Organization of the United Nations Regional Training Seminar on Remote Sensing Applications (Ibadan, Nigeria; 5-23 November 1979), Doc. A/AC.105/254 (1980).

*United States**Code of Federal Regulations*

Title 16, Communications Practices, Parts 150-999—Revised as of June 1, 1980.

*Congress*

U.S. House Comm. on Science and Technology, Hearings Before the Subcomm. on Space Science and Applications; International Space Activities, 1979, 96th Cong., 1st Sess. (Sept. 5 and 6, 1979).

U.S. House Comm. on Science and Technology, Hearings Before the Subcomm. on Space Science and Applications; NASA Space and Terrestrial Applications User Development Activities, 95th Cong., 2d Sess. (June 27th, 28th, 29th, 1978).

U.S. House Comm. on Science and Technology, Hearings Before the Subcomm. on Space Science and Applications; Space Shuttle Cost, Performance and Schedule Review, 96th Cong., 1st Sess. (June 28, 1979).



- U.S. House Comm. on Science and Technology, Hearings Before the Subcommittee on Space Science and Applications on Space Shuttle Operational Planning, Policy and Legal Issues, 96th Cong., 1st Sess. (1979).
- U.S. House Comm. on Science and Technology, Hearings Before the Subcomm. on Space Science and Applications: Space Telescope Program Review, 95th Cong., 2d Sess. (July 13, 1978).
- U.S. House Comm. on Science and Technology, Hearings Before the Subcommittee on Transportation, Aviation, and Communications on 1981 NASA Authorization, 5 Volumes, 96th Cong. 2d Sess. (1980).
- U.S. House Comm. on Science and Technology, Hearing on 1981 DOE Authorization, Volumes I and II 96th Cong. 2d Sess. (1980).
- U.S. House Comm. on Science and Technology, Report Prepared for the Subcomm. on Space Science and Applications by the Library of Cong., Cong. Research Service, U.S. and Soviet Progress in Space: Summary Data Through 1979 and a Forward Look, 96th Cong. 2d Sess. (Comm. Print. 1980).
- U.S. House Comm. on Science and Technology, Status Report on Space Shuttle, 1979, 95th Cong., 2d Sess. (Dec. 1978).
- U.S. House Comm. on Science and Technology, Status Report on Space Shuttle, 1980, 96th Cong., 2d Sess., (Jan. 1980).
- U.S. Sen. Comm. on Commerce, Science, and Transportation, Agreement Governing the Activities of States on the Moon and Other Celestial Bodies, Parts 1 and 2 (prepared by Eilene Galloway) and Part 3, 96th Cong. 2d Sess. (Comm. Print. 1980).
- U.S. Sen. Comm. on Commerce, Science and Transportation, Hearings on NASA Authorizations for Fiscal Year 1981, 4 Parts, 96th Cong. 2d Sess. (Comm. Print. 1980).
- U.S. Sen. Comm. on Commerce, Science, and Transportation, Hearings Before the Subcomm. on Science, Technology and Space: Operational Remote Sensing Legislation, 96th Cong. 1st Sess. (July 31, 1979).

#### NASA

Space Resources and Space Settlements (NASA Sp. 428, 1979).

**D. Miscellaneous (pamphlets, etc.)**

Gorbiel, Legal Definition of Outer Space (Universytet Lodzki, 1980).

Gorbiel, Les aspects juridiques internationaux de l'utilisation de l'orbite geostationnaire, pp. 1-32 (Lodz, 1979).

- Aeronautical Satellite Programme (Aerosat), 37.  
 Agreement Governing the Activities of States on the Moon, 43, 163, 200, 202-203, 205.  
 Agreement on the Rescue of Astronauts, the Return of Astronauts and the Return of Objects Launched into Outer Space, 162.  
 Anti-satellite systems (ASAT), 46, 47, 50.
- Bogota Declaration, 160, 167.
- Book Reviews/Notices  
     Ezell, E.C. & Ezell, L.N., *The Partnership: A History of the Apollo-Soyuz Test Project*, 89.  
     Gorove, S. *The Space Shuttle and the Law* (D. Fuqua), 209.  
     Grey, J. and Krop, C. (eds.), *Space Manufacturing Facilities-3*, 212.  
     Hechler, K. *Toward the Endless Frontier: History of the Committee on Science and Technology, 1959-79*, 212.  
     Matte, N.M. *Space Policy and Programmes Today and Tomorrow: The Vanishing Duopole* (N. Jasentuliyana), 209.  
     Rector, W.F. III & Penzo, P.A., *Space Shuttle: Dawn of an Era*, 90.  
     Vasilevskaja, E.G., *Pravovyy status prirodnykh resursov luny: planiet (Legal Status of the Natural Resources of the Moon and Other Planets)*, (K. Wiewiorowska), 87.  
     Vereshchetin, V.S., *International Cooperation in Outer Space: Legal Problems*, (J. Gospodarek), 85.
- Budget and Impoundment Control Act, 6.
- Convention on International Liability for Damage Caused by Space Objects of 1972, 162  
 Committee on Disarmament, 48, 50, 51, 54, 55.  
 Committee on the Peaceful Uses of Outer Space (COPUOS), 42, 51, 103-104, 112, 116, 118, 135, 157, 159  
     174-187.  
         Legal Subcommittee, 106-110, 114, 118, 158, 175, 178, 180, 184.  
         Scientific and Technical Subcommittee, 104-116, 118, 135, 158, 172, 184, 186.
- Common Heritage of Mankind, 43, 202.  
 Communications Satellite Act of 1962, 16, 17.  
 Communications Satellite Corporation (COMSAT), 16, 30-34, 37, 38.  
 Convention of the Registration of Objects Launched into Outer Space, 136, 163, 164
- Current Documents  
     American Bar Association Report to The House Of Delegates Section of International Law, 76-77.  
     Draft Resolution on Space Law for Adoption by the Belgrade Conference of the I.L.A. (August, 1980), 192-193.  
     Report of the Chairman of the Working Group on Direct Television Broadcast Satellites, 65-70.  
     Report of the Chairman of the Working Group on Remote Sensing, 70-75.  
     Report of the Working Group on the Use of Nuclear Power Sources in Outer Space on The Work of its Second Session, 59-64.  
     Texts of Draft Principles as Contained in the Reports of the Legal Sub-Committee on the Work of its Eighteenth Session, (DBS), 188-192.
- Demarcation (delimitation) between Outer Space and Airspace, 43, 154-173, 180-183.  
 Direct Television Broadcasting by Satellites, (DBS), 178-180, 187.
- Events of Interest, 79-83, 194-208.  
     A. Past Events, 79, 194.  
         First Seminar on the Outer Space Law of the Interkosmos Countries, Warsaw, October 3-5, 1979 (K. Wiewiorowska), 79.  
         Symposium on "Space Law in Perspective", University of Mississippi Law Center, April 21, 1980 (S. Gorove), 80.  
         Program on International and Domestic Aerospace Law at the AIAA Global Technology 2000 Meeting, Baltimore, May 8, 1980 (G.J. Mossinghoff), 81.

- Conference on "World Communications: Decisions for the Eighties", The Anneberg School of Communications, University of Pennsylvania, May 12-14, 1980 (S. Gorove), 82.
- Space Law Workshop, Annual Meeting of the American Society of International Law, Washington, D.C., August 18, 1980 (M. Menter), 79.
- Space Law Session, Belgrade Conference of the International Law Association, August 18, 1980 (D. Goedhuis), 194.
- Symposium on "Satellites, Space and International Law, Annual Convention of the Federal Bar Association, Washington, D.C., August 27, 1980 (H. Berger), 199.
- The 28th Colloquium on the Law of Outer Space, Tokyo, Japan, Sept. 21-28, 1980 (I.H.Ph. Diederiks-Verschoor), 200.
- Symposium on Space Activities and Implications, Centre for Research of Air and Space Law, McGill University, Montreal, Oct. 16-17, 1980 (J.L. Magdelenat), 206.
- Session of the AALS Section on Mass Communications Law on the Future of International Communications, San Antonio, Jan. 4, 1981 (S. Gorove), 207.
- Other Events, 82, 207.
- Brief News, 83, 208.
- B. Forthcoming Events, 83, 208.
- European Communications Satellite Programme, 38.
- Federal Communications Commission, 16, 17.
- Final Act of the Special Session on Disarmament, 55.
- Freedom of Information Act, 6.
- Fuqua, Don, *Space Industrialization: Some Legal And Policy Considerations For Private Enterprise*, 1-7.
- Geostationary Orbit, 166, 167, 170, 180-183, 187.
- Gorove, Stephen, *The 1980 Session of the U.N. Committee on the Peaceful Uses of Outer Space: Highlights of Positions on Outstanding Legal Issues*, 174-187.
- Government Corporation Control Act, 5.
- Interim Arrangements for a Global Commercial Communication Satellite, 37.
- International Atomic Energy Agency, 141.
- International Maritime Consultative Organization (IMCO), 9, 26-28.
- International Maritime Satellite Organization (INMARSAT),  
     Convention on, 11-39.  
     Operating Agreement on, 18, 34, 36.  
     Preparatory Committee of, 17-30.
- International Maritime Satellite Telecommunications Act, 17.
- International Radio Consultative Committee, 10.
- International Telecommunication Convention of 1973, 169, 170.
- International Telecommunications Satellite Organization (INTELSAT)  
     Agreement Relating to, 15-17, 27, 37.  
     Plenipotentiary Conference on Definitive Arrangements for  
     International Telecommunication Union (ITU), 10, 21.
- Kopal, Vladimir, *The Question of Defining Outer Space*, 154-173.
- Lay, Fernando, *Space Law: A New Proposal*, 41-57.
- Militarization of Outer Space, 44-48.
- Mossinghoff, Gerald J. and Fuqua, Laura D. *United Nations Principle on Remote Sensing: Report on Developments, 1970-1980*, 103-153.
- National Aeronautics and Space Act, 1, 2.
- National Aeronautics and Space Administration, 1, 7.
- Nuclear Power Sources (NPS) in Space, 184-187.

Outer Space Treaty, see Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies.

Paris Convention of 1919, 154.

Recent Publications (listing), 91-101, 214.

Books, 91, 214.

Articles, 91-94, 214-216.

Book Reviews/Notices, 94, 216.

Official Publications, 94-96, 216-218.

Miscellaneous, 96-101, 219.

Remote Sensing, 103-153, 175-177, 187.

Documents on, 119-153.

Principles on, 103-118.

SALT I, 47.

SALT II, 46.

Salyut, 41.

Skylab, 1.

Sondaal, H.H.M., *The Current Situation In The Field Of Maritime Communication Satellites*, 9-39.

Space Industrialization, 1-2, 4-6.

Spacelab, 1, 41.

Space Shuttle (Space Transportation System), 1, 41, 47, 186-187.

Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies, 44, 45, 48, 53-55, 57, 203-204.

United Nations Conference on the Exploration and Peaceful Uses of Space, 43.

United Nations Conference on the Law of the Sea, 43.

United Nations Disarmament Commission (UNDC), 50.

World Administrative Radio Conference, 10, 160, 183, 201.

World-Satellite-Monitoring Agency, 47.