

from the interpretation and application of the convention on liability. In addition, the Board of Directors added three pioneering topics relating to law-making for outer space, responsibility for space activity, development of air and space law, divergencies and convergencies.

758. The 16th Colloquium, which will take place at Baku, in 1973, will discuss in particular the impact of space law on general international law; legal aspects of direct broadcasts, and of earth resources research and environment; legal problems concerning the moon and other celestial bodies; and the legal régime of earth orbital stations.

759. A third Symposium on the teaching of space law will be held at the time of the IAF Congress at Baku in 1973. The previous symposia took place in Buenos Aires in 1969 and in Brussels in 1971. The professors of space law and the lawyers present at the Brussels Symposium adopted a resolution calling the attention of all competent authorities in educational matters throughout the world to the great importance of establishing specific lectures on space law in universities, legal and technical institutes, and schools with analogous programmes.

760. The Institute is preparing a booklet on the IISL to be published in 1973.

Paragraph 765: for last sentence substitute

The Bibliography for 1972 is in preparation.

For paragraphs 766 and 767 substitute

766. The proceedings of the annual colloquia have been regularly issued since the first colloquium; each volume contains the reports and papers presented at the session and, since four years, a summary of the discussions. They are prepared by the Law Librarian of the University of California and distributed by Rothman and Co. (South Hackensack, New Jersey).

767. The Institute is preparing a complete and revised edition of its world-wide survey on the teaching of space law which will be used as a basis of the discussions at the third Symposium on the subject, to be held at Baku in 1973. The first survey was published in 1969 for the first Symposium and was up-dated in 1971 for the second Symposium.

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COMMITTEE ON THE PEACEFUL USES  
OF OUTER SPACE

SPACE ACTIVITIES AND RESOURCES: A REVIEW OF THE ACTIVITIES  
AND RESOURCES OF THE UNITED NATIONS, OF THE SPECIALIZED  
AGENCIES AND OF OTHER COMPETENT INTERNATIONAL BODIES RELATING  
TO THE PEACEFUL USES OF OUTER SPACE

Addendum

Supplementary information for 1973\*

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\* In accordance with the decision of the Committee, the Review is to be published at least once every three years, with annual supplements in the intervening years. The first issue was published as document A/AC.105/100 and Corr.1 (United Nations publication, Sales No. E.72.I.11), and covered events up to 1971. The first supplement, A/AC.105/100/Add.1, covered events in 1972. This issue is the second supplement.

\*\* Not included. No additional information has been received.

\*\*\* Not included. Aspects of these activities are referred to in paragraphs 19 and 31, on pages 6 and 10 respectively.

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\*\*\*\* ELDO and ESRO are scheduled to be incorporated into a European Space Organization on 1 April. No additional information has been received to date.

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I. UNITED NATIONS

A. Committee on the Peaceful Uses of Outer Space

1. In 1973, the Committee on the Peaceful Uses of Outer Space continued to carry out its programme designed to promote international co-operation in the scientific, technical and legal fields of peaceful uses and exploration of outer space.
2. Under the chairmanship of Mr. Peter Jankowitsch (Austria), with Mr. Ion Datcu (Romania) as Vice-Chairman, and Mr. Calso Antonio de Souza e Silva (Brazil) as Rapporteur, the Committee met from the last week in June through the first week in July 1973 to consider the reports of its subsidiary bodies: the Legal Sub-Committee, which had met in New York in March and April, the Scientific and Technical Sub-Committee, which had met in May, and the Working Group on Direct Broadcast Satellites, which had met in June. It also considered several other matters and prepared and submitted its report to the twenty-eighth session of the General Assembly (A/9020).
3. Towards the end of its session, the Committee elected Mr. Luiz Felipe de Seixas-Correa (Brazil) as its Rapporteur to replace Mr. de Souza e Silva, who had been assigned to a new post.

Activities of the Committee

(a) Legal activities

4. The Committee, at the opening of its sixteenth session, and in response to recommendations made by the Legal Sub-Committee at its twelfth session, decided to establish an informal Working Group of the Whole to try to achieve further progress on the texts of the draft treaty relating to the moon and the draft convention on the registration of objects launched into outer space, in accordance with General Assembly resolution 2915 (XXVII) of 9 November 1972. Following its deliberations, the Committee recommended that, as a matter of highest priority, consideration be given by the Legal Sub-Committee at its next session to these two items with a view to completing both drafts.
5. Since the Sub-Committee had been unable to consider the remaining items on its agenda because of lack of time, the Committee also requested the Sub-Committee to take up at its next session, in accordance with General Assembly resolution 2916 (XXVII) of 9 November 1972, and taking due account of the work done by the Working Group on Direct Broadcast Satellites, the question of the elaboration of principles governing the use by States of artificial earth satellites for direct television broadcasting with a view to concluding an international agreement or agreements. In this connexion, the Committee also referred to resolution 2917 (XXVII), which noted that the work done on the draft convention on freedom of information and the deliberations of the General Assembly on that subject might be useful in the discussion and elaboration of these international instruments.

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6. It was also recommended by the Committee that, for part of its next session, the Legal Sub-Committee devote itself to replying to a request by the Working Group on Remote Sensing of the Earth by Satellites on the legal implications of earth resources surveying by remote-sensing satellites, and thereafter, if time still permitted, to pursue its consideration of matters relating to the definition and/or delimitation of outer space and outer space activities.

(b) Scientific and technical aspects

7. In reviewing the report of the Scientific and Technical Sub-Committee on its tenth session, contained in document A/AC.105/116, the Committee supported the recommendations of the Sub-Committee dealing with the various aspects of international co-operation in the technical and scientific field, including the United Nations space applications programme.

(i) United Nations programme on space applications

8. The Committee approved the United Nations space applications programme for 1974 and endorsed the Sub-Committee's recommendation for an annual review of the programme. Designed to further international co-operation in this field by dissemination of information and creating of awareness of the various potential benefits of practical applications to development, the programme envisaged the continuation of technical panels, seminars and workshops, consultation with government officials in developing countries and administration of fellowships offered by Member States. The Committee also agreed in principle with the recommendation made by the Expert in charge of Space Applications, as endorsed by the Sub-Committee, that future planning should be based on long-range considerations.

9. With a view to wider dissemination of information concerning possible assistance to developing countries, the Committee endorsed the recommendation of the Sub-Committee that, within available resources, the Secretary-General should prepare a comprehensive report on assistance to developing countries, particularly by the specialized agencies and the United Nations Development Programme (UNDP) in the field of space applications.

(ii) Remote sensing of the earth by satellites

10. The Committee expressed particular satisfaction with the work performed and the progress made by the Working Group on Remote Sensing of the Earth by Satellites and the various measures being contemplated to further international co-operation in this field, particularly for the benefit of the developing countries.

11. The progress reported in document A/AC.105/111 by the Working Group on Remote Sensing of the Earth by Satellites was commended by the Committee and the recommendations of the Sub-Committee with regard to measures to be taken in the future by the Working Group were approved. The principal measures recommended by the Sub-Committee included the preparation of a second survey of potential users of remote sensing, the establishment of a task force to study the best means of data

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dissemination and utilization, and the preparation of an information pamphlet in lay language, especially for use by the developing countries.

12. The Task Force, open to all members of the Working Group, was scheduled to meet in February 1974 in a combined session with the Working Group. In reviewing the various possible alternatives for the dissemination and optimum utilization of data obtained by remote sensing from space, the Task Force would have at its disposal replies from Member States to a questionnaire sent by the Secretary-General on 25 July 1973 on various points related to the utilization of remote sensing, on which the Working Group would require information. <sup>1/</sup>

(iii) Direct broadcast satellites

13. Reviewing the report of the fourth session of the Working Group on Direct Broadcast Satellites (A/AC.105/117), which had met in June 1973, the Committee expressed its satisfaction at the progress achieved by the Working Group in its study of the substantive technical, economic and other material made available to it since its last session. Recent developments involving joint international technical projects in direct satellite broadcasting, such as the scheduled launching of the first ATS-F (Application Technology Satellite) in 1974 and the CTS (Communication Technology Satellite) in 1975 had been brought to the attention of the Working Group, as had the relevant programmes of some of the specialized agencies, particularly the work of UNESCO, WIPO and ITU, with, in some instances, the financial assistance of UNDP. These programmes were welcomed, as were the Final Acts of the World Administrative Radio Conference for Space Telecommunications (WARC-ST), which would aid in regulating the administration of future satellite communications systems. The Committee also noted that members of the Working Group had expressed varying views concerning the numerous implications of direct broadcasting by satellites and that they had discussed the question of elaborating principles governing the use by States of such satellites, referred to in General Assembly resolution 2916 (XXVII). In this connexion, the Committee supported the view of the Working Group that it should give primary attention to the legal and political problems involved while also studying the technical developments and economic factors, and it agreed that the Working Group should hold another session prior to the meeting of the Legal Sub-Committee which was scheduled to be held in May 1974, with a view to making recommendations to the Legal Sub-Committee on its work on this question.

14. In approving the conclusions and recommendations of the Working Group, the Committee also endorsed the view that increased international co-operation should be sought so that the maximum benefits derived from this technology could be made available particularly to the developing countries.

<sup>1/</sup> The activity of the Task Force and the Working Group on Remote Sensing of the Earth by Satellites, which held their combined session from 13 February to 5 March (A/AC.105/123) will be covered in the next review.

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(iv) Education and training

15. The Committee was appreciative of the offers made by Member States to host United Nations-sponsored panels and seminars and to provide fellowships in various disciplines of space applications and in space technology in general. Invitations to host technical panels had been extended by the Governments of Mexico, India, France and Ethiopia, as well as by Japan and Egypt. Renewals of offers of scholarships had also come from the Governments of Brazil, India, Italy, Japan, the United Kingdom and the United States.

16. In recommending that Member States continue to participate in space applications programmes and to utilize the fellowship offers of Member States, the Committee re-emphasized that a regional or wider basis for holding panels and seminars should be sought, so that the dissemination of information and the sharing of experience could be made available to as many candidates as possible.

(v) Exchange of information

17. The Committee continued to receive information from Member States on their national and co-operative space activities and programmes. Member States submitting information during 1973 included Argentina, Austria, Canada, France, India, Poland, Romania, Sweden and the United Kingdom. Some members of the Committee provided additional information on their activities during the sixteenth session of the Committee.

(vi) International sounding rocket facilities

18. The Committee expressed satisfaction with the reports submitted by the Vikram Sarabhai Space Centre at the Thumba Equatorial Rocket Launching Station in India and the CELPA Mar del Plata international rocket launching facilities in Argentina, and recommended that the General Assembly continue United Nations sponsorship of the two ranges.

(vii) Other matters

19. Among the other matters discussed by the Committee was the future role and functions of the Scientific and Technical Sub-Committee, and in reviewing the section of the Sub-Committee's report dealing with this subject, the Committee supported the suggestions made as to the future activity of the Sub-Committee. Specifically, it felt that among the priority items to be given consideration at the next session of the Sub-Committee were remote sensing of the earth by satellites in all its aspects, including the contribution of satellites to the solution of environmental problems, and the United Nations programme on space applications. The Committee also referred to the views it had expressed in the past and the recommendations it had made regarding the need to maintain proper co-ordination of United Nations activities relating to the peaceful uses of outer space.

20. Another matter discussed was that of enlarging the membership of the Committee, but because of the wide range of opinions and suggestions made among the delegations,

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no definite recommendations could be made by the Committee on this subject. <sup>2/</sup> The question was eventually discussed in the General Assembly, which decided to request the President of the Assembly, in consultation with regional groups and with the Chairman of the Committee, to designate not more than nine additional members, taking into account the principle of equitable geographic distribution. <sup>3/</sup>

21. Finally, the Committee discussed measures for enhancing the effectiveness of the Outer Space Affairs Division, and, in this connexion, it welcomed the statement of the Under-Secretary-General for Political and Security Council Affairs that the decision of the Secretary-General to establish two sections in the Outer Space Affairs Division had been implemented and also that additional staff for the Division was contemplated. The Committee expressed its support for these measures.

B. United Nations Secretariat

Outer Space Affairs Division

22. During 1973, the Outer Space Affairs Division, as the Secretariat unit responsible for assisting the Secretary-General in carrying out the United Nations responsibility in international co-operation in the peaceful uses of outer space, continued to implement the decisions and recommendations in this field made by the General Assembly and the Committee on the Peaceful Uses of Outer Space.

23. The Division in this connexion provided substantive secretariat services during the first and second sessions of the Working Group on Remote Sensing of the Earth by Satellites held in May 1972 and in February 1973; the fourth session of the Working Group on Direct Broadcast Satellites in June 1973; the tenth session of the Scientific and Technical Sub-Committee in May 1973; and the sixteenth session of the Committee on the Peaceful Uses of Outer Space in September 1973. It assisted the secretariat of the First Committee during the consideration of the agenda items relating to outer space during the twenty-eighth session, and carried out other administrative and liaison functions required in the implementation of the decisions of the General Assembly and the Committee on the Peaceful Uses of Outer Space.

<sup>2/</sup> The principal views expressed by Member States on this matter were that enlargement should not only provide for more equitable geographic distribution, but also for appropriate representation by developing countries; that the General Assembly might wish for the Committee to formulate proposals and report to the Assembly at its next session on the question of enlarging its membership; and that the matter was within the purview of the General Assembly itself, and therefore the Committee should make no recommendations.

<sup>3/</sup> On 14 February 1974, the President of the Assembly, in a letter to the Secretary-General (A/9492), appointed the following States as members of the Committee: Chile, German Democratic Republic, Germany (Federal Republic of), Indonesia, Kenya, Nigeria, Pakistan, Sudan, and Venezuela.

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24. In response to a request made to the Secretary-General by the Working Group on Remote Sensing of the Earth by Satellites at its second session, the Division updated a background paper assessing United Nations documents and other pertinent data related to remote sensing which the Working Group had used as a basis of discussion during its session. The revised and updated background paper <sup>4/</sup> was later submitted to Member States as part of a documentation accompanying a questionnaire sent to them by the Secretary-General on 25 July 1973, requesting their views on certain questions relating to the technical, scientific, organizational and legal aspects of remote sensing of the earth by satellites.

25. In the implementation of the United Nations programme on space applications, the Division provided assistance to the Expert in charge of space applications in organizing two technical panels and one summer school organized by the French Government. The first panel, held in Buenos Aires from 3-7 December 1972 at the invitation of the Government of Argentina, dealt with the results of the ERTS-1 survey as applicable to the Latin American region. Its objective was to provide specialized scientific personnel and users of remotely sensed data, having a scientific or technical background in the areas of agronomy, agriculture, forestry, geology or cartography, with information on remote sensing techniques, platforms on which sensors can be flown, and preliminary results specifically obtained in the area of remote sensing. As other previous United Nations technical panels, the panels in Argentina was a regional panel held for the benefit of countries in the ECLA region. Participants from 14 Latin American countries attended the panel, of whom 17 were funded wholly or in part by the United Nations. Experts in the field from the United States and Argentina and Brazil were among those conducting the technical panel. The report of this panel was issued as document A/AC.105/121.

26. The other panel was a joint United Nations/UNESCO African regional seminar, held in Addis Ababa from 22-31 October 1973 at the invitation of the Government of Ethiopia. Concerned with satellite broadcasting systems for purposes of education and development and held for the benefit of African countries in the ECA region, the seminar was attended by 31 participants from 23 Member States and representatives from ECA and ITU which co-operated in the organization of the seminar. The report of this seminar was issued as document A/AC.105/120.

27. The Outer Space Affairs Division also provided assistance to the French Government in organizing a summer school on remote sensing in Tarbes, from 2 August to 20 September 1973. The school, organized by the French National Centre for Space Research (Centre national d'études spatiales - CNES), and sponsored by the United Nations was held primarily for the benefit of participants from African countries. The French Government provided financial assistance for board for the participants, while the United Nations provided the travel grants for most of them.

28. Also in implementation of the United Nations programme on space applications, the Expert in charge of space applications met with Government officials in a

<sup>4/</sup> Background paper by the Secretary-General assessing United Nations documents and other pertinent data related to the subject of remote sensing of the earth by satellites (A/AC.105/118).

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number of African countries to discuss the various existing programmes and plans in the field of international co-operation in the practical applications of space technology and the various possibilities being opened up by this new technology to development.

29. Also consulted by the Expert during the year were the various specialized agencies which had co-operated in the implementation of the United Nations programme on space applications.

30. With a view to further co-operation with interested United Nations bodies, the Division provided assistance to the United Nations Institute for Training and Research (UNITAR) in organizing a panel discussion, held at Headquarters in New York on subjects relating to practical applications of space technology for non-members of the Outer Space Committee, particularly for the benefit of developing countries. It also co-operated with UNITAR in the publication of a small informative pamphlet on the subject of practical applications, which was published by UNITAR and distributed to members of the First Committee during the consideration of the Outer Space item at the twenty-eighth session. <sup>5/</sup>

31. With regard to co-ordination of activity related to practical applications of space technology, the Division has continued participation in the ACC Ad Hoc Working Group on Practical Applications, which met in New York during July 1973 to review the areas of activity of the United Nations and the specialized agencies in this field.

#### Resources and Transport Division

32. The Geology and Mining Section of the Resources and Transport Division was represented at the Third ERTS Symposium sponsored by the NASA Goddard Space Flight Centre and held in Washington in December 1973. The papers contributed by a number of institutions and subsequent discussions have confirmed the Division's view that the application of space imagery to mineral exploration will, in the foreseeable future, rest largely on provision of data complementary to orthodox aerophotography in that it offers a broader, regional view of the terrain which may better demonstrate large scale structural elements. The enlarged ERTS images are also likely to show many more linear features than standard photography or ground mapping techniques. The patterns of such linears are of considerable importance in direct search for ore deposits since, in a metallogenic province, they help locate the foci of mineral deposition. Further processing of ERTS imagery can also reveal alteration patterns and other indications of possible mineral potential in the region under study.

33. The Geology and Mining Section is substantively supporting a project in Bolivia designed to make a survey of soils, forests, geology and drainage over a large part of the country by interpretation of ERTS imagery. The Governing Council of UNDP approved the project at its sixteenth session (June 1973). The UNDP contribution amounts to \$150,000. Preparatory, pre-project activities commenced early in 1973.

<sup>5/</sup> "UN and Outer Space", UNITAR News, vol. 5, No. 2, 1973.

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34. With regard to the activities of the Cartography Section of the Division, the Seventh United Nations Regional Cartographic Conference for Asia and the Far East was held at Tokyo, Japan, from 15 to 27 October 1973. <sup>6/</sup> The Conference was attended by 172 representatives and observers from 40 countries, one specialized agency (UNESCO), two intergovernmental organizations (IHO, PAIGH) and seven international scientific organizations (COSPAR, IGU, IOC, ICA, FIG, ISP and SCAR).

35. Matters related to the peaceful uses of outer space came under three items of the agenda dealing specifically with:

- (a) Remote sensing, mapping methods for environmental research and control;
- (b) Earth resources satellites for survey, mapping and earth resources studies; and
- (c) Geodesy and ground control (comprising satellites geodesy).

36. To these agenda items 16 technical papers were directed and the Conference adopted 27 resolutions. Three of them deal in particular with remote sensing, satellite imagery and satellite geodesy. A brief summary is given below.

37. The Conference noted that satellite imagery can provide great coverage of territory and is also nearly orthographic, and its consistency is reliable. The imagery can indicate gross patterns of land use, distribution of snow, levels of lakes, and geological forms of significance. It appears to have particular value in areas of high relief, in the revision and improvement of small scale maps and in the continuous monitoring of the environment. The continuation and further development of remote sensing satellite programmes to benefit the countries of the region was therefore recommended.

38. The Conference noted that remote sensing techniques, from either aircraft or satellite, not only widen the field of data coverage by identifying surface pictures, geological features and vegetation as well as the hydrography and topography of a region, but that acquisition is not eliminated by weather or darkness. It was felt that the new developments in radar survey will lead to significant improvements in medium and small scale mapping throughout the region with particular impact in remote areas, and that the potential of remote sensing techniques for use on environmental control and the benefits of a multidisciplinary approach to interpretation should be recommended.

39. It was felt that in view of the recent developments in satellite geodesy, the progress made in world-wide geodetic satellite programmes and the proven ease and capability of determining the co-ordinates of geodetic stations by the Doppler method of satellite observations, a Unified World Geodetic Datum should be recognized to which national datums could be referenced. From these, geodetic and mapping control could be extended by modern ground and air methods supplemented by satellite observations. The continuation of the present Doppler satellite system should be encouraged and assistance in this field given to developing countries.

<sup>6/</sup> Report of the Conference, document E/CONF.62/3.

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In levelling surveys, the countries' efforts should be concentrated in the undertaking of national surveys to provide control for mapping operations and also for crustal movement studies.

40. The Cartography Section is co-operating closely with the Expert in charge of space applications of the Division of Outer Space Affairs in the preparation of the forthcoming Interregional Seminar on Remote Sensing Applications for Cartography (surveying and mapping) which is to be held from 4-15 November 1974 in Sao Paulo (Brazil).

41. A draft programme has been prepared and the Seminar will consider the following items: satellite geodesy; mapping, charting and resources inventories from satellite photography and imagery; economic feasibility of satellite survey systems and methods and their value to the developing countries; international co-operation in earth-resource satellite programmes.

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## II. SPECIALIZED AGENCIES

### A. International Telecommunication Union (ITU)

The following text brings up to date those passages of the Review (paragraphs 165-299) and its Addendum which relate to ITU.

After paragraph 175: insert

In 1973 ITU held a Plenipotentiary Conference (Malaga-Torremolinos, 14 September to 25 October). The Conference reviewed the International Telecommunication Convention, which is the basic instrument of ITU. In particular, it examined the role of telecommunications in the peaceful uses of outer space. Recognizing again the fact that the new area opened by space telecommunications was one which, although embodying enormous potential, presented problems that could be studied and solved within existing ITU structures, the Conference made no fundamental changes in the Convention, which will enter into force on 1 January 1975. On the other hand, it adopted a number of provisions designed to define more clearly the role of ITU in space telecommunications.

Thus, the following duty has been added to article 10 of the new Convention, which defines the essential duties of the International Frequency Registration Board (IFRB):

"To effect, under the same conditions and for the same purpose, an orderly recording of the stations assigned by countries to geostationary satellites."

The title of article 33 of the new Convention has been changed to "Rational use of the radio-electrical frequency spectrum and of the orbit of geostationary satellites", and the article specifies that

"In the use of frequency bands for space radiocommunications, Members shall take account of the fact that the frequencies and the orbit of geostationary satellites are limited natural resources which should be utilized effectively and economically, in order that access to the orbit and frequencies may be equitably afforded to the different countries or groups of countries, according to their needs and to the technical means at their disposal, in conformity with the provisions of the Radio Regulations."

The resolutions adopted at Torremolinos include some which do not refer explicitly to outer space but nevertheless affect space radiocommunications and, in particular, the utilization of space applications by the developing countries. Thus, in resolution 17 it was decided to maintain the Engineers' Group of the Technical Co-operation Department for providing short-term assistance to the developing countries; one of the engineers in the Group is a specialist in space affairs.

Resolution 18 (Application of telecommunication science and technology in the interest of developing countries), holding that the International Telecommunication

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Union should associate itself in every possible way with the efforts being thus undertaken by the organizations of the United Nations family, instructs the International Radio Consultative Committee (CCIR) to undertake as a matter of urgency studies of the technical and operational aspects of the development of low-capacity ground stations and of the associated satellite systems, with a view to meeting the urgent needs of the least-developed countries and enabling them to be connected by high-quality circuits to the international telecommunication network.

Resolution 25 deals with measures for pursuing and intensifying efforts in the field of seminars.

In resolution 27, the Plenipotentiary Conference decided that a world administrative radio conference for the planning of the broadcasting-satellite service in the frequency band 11.7-12.2 GHz (12.5 GHz in region 1) shall be convened not later than April 1977 and instructed the Administrative Council to make preparations for convening that conference.

Resolution 28 called for convening in 1979 a world administrative radio conference to revise the Radio Regulations and the additional Radio Regulations.

It should be recalled that the Radio Regulations contain, inter alia, all of the regulatory provisions for ensuring the harmonious operation of space radiocommunications.

Resolution 37 deals more particularly with ITU's collaboration with international organizations interested in space radiocommunications. The text of that resolution is given below:

#### Resolution 37. Collaboration with international organizations interested in space radiocommunications

The Plenipotentiary Conference of the International Telecommunication Union (Malaga-Torremolinos, 1973),

##### Mindful

Of the numerous possibilities for the use of outer space for peaceful purposes in the international field;

##### Considering

The increasing importance of the role that telecommunications, and in consequence the Union, are necessarily playing in this sphere;

##### Recalling

The relevant articles 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 as well as the Resolutions adopted by the United Nations General Assembly on international collaboration in the peaceful uses of outer space;

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Notes with satisfaction

(a) The measures taken by the various organs of the Union with a view to ensuring the most effective possible use of all space radiocommunication services;

(b) The progress made in the technology and use of space radiocommunication;

Calls upon the Administrative Council and the Secretary-General

To take the necessary steps to:

1. Continue to keep the United Nations and the specialized agencies concerned informed of progress in space radiocommunication;
2. Promote the continuance and development of collaboration between the Union and the specialized agencies of the United Nations or other international organizations interested in the use of space radiocommunication.

The documents adopted at Malaga-Torremolinos relating directly or indirectly to outer space give evidence of ITU's willingness to work for the harmonious development of the various peaceful uses of outer space, in conformity with the principles laid down by the United Nations and in complete co-operation with that Organization.

After paragraph 237: insert

In 1973 IFRB received and dealt with 2,367 frequency assignment notices in space radiocommunications services. The notices related, in particular, to the establishment or modification of space systems and to the execution of experimental programmes.

After paragraph 254: insert

In 1973 CCIR continued its studies on all aspects of space telecommunications within the scope of its questions and study programmes, with a view to achieving the objectives fixed by various recommendations of the World Administrative Conference for Space Telecommunications held at Geneva (1971). The purpose of those studies was to make preparations for the final meetings of the Study Groups, which were to be held in February-March 1974, before the XIIIth Plenary Assembly of the Committee.

The work of the CCIR Study Groups relating to space radiocommunications was continued during 1973. We should mention in particular the meeting of a Working Group specially set up to study questions relating to the effective utilization of the orbit of geostationary satellites.

Reference may also be made to the currently developing interest in new

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possibilities such as, for example, the use of numerical techniques in telecommunications and the utilization of higher and higher frequencies.

A Working Group has met for the purpose of evaluating the propagation factors involved in questions of interference at frequencies higher than about 1 GHz.

CCIR also continued the study of typical specifications and of the preferred frequencies for mobile ground stations used in radiocommunications intended for rescue operations in case of natural disaster. In addition, it studied the problems raised by the use of satellites intended for low-capacity systems.

Lastly, reference should be made to the continuance of the work of the Group specially entrusted with the study of systems that can be used for satellite broadcasting and of the relative degree of acceptability of such systems.

After paragraph 256: insert

Studies conducted in 1973 by the Study Groups of CCITT related, inter alia, to the influence of propagation times of circuits by satellite on the use of standardized signalling systems by CCITT and on the parameters to be defined for systems of maritime telephone communication by satellite which were to be integrated into the general telephone network.

Paragraph 259: add

In 1973 CCITT prepared and published the texts of this handbook concerning international telecommunications by satellite. It also began the preparation of texts relating to national or regional telecommunications satellites.

After paragraph 363: insert

As stated above, the Plenipotentiary Conference held at Malaga-Torremolinos adopted resolution 27 relating to the broadcasting-satellite service. The text of this resolution is given below:

Resolution 27. World Administrative Radio Conference  
for the Planning of the Broadcasting-Satellite  
Service in the Frequency Band 11.7-12.2 GHz (12.5 GHz  
in region 1)

The Plenipotentiary Conference of the International Telecommunication Union (Malaga-Torremolinos, 1973),

Considering

(a) That there is an urgent need in certain parts of the world to bring into use frequencies within the band 11.7-12.2 GHz (12.5 GHz in region 1) for terrestrial services to which the band is also allocated;

/...

(b) That it is highly desirable that this should be done on the basis of a world-wide plan for the broadcasting-satellite service;

(c) That the CCIR expects to produce sufficient technical data for planning purposes at its XIIIth Plenary Assembly;

Resolves

That a World Administrative Radio Conference for the Planning of the Broadcasting-Satellite Service in the frequency band 11.7-12.2 GHz (12.5 GHz in region 1) shall be convened not later than April 1977;

Instructs the Administrative Council

To make preparations for convening that Conference.

After paragraph 268: insert

The Regional Commission on the Plan for Latin America met in 1973, as did the Co-ordinating Committees on the Plan for Europe and the Mediterranean Basin and on the World Plan.

Paragraph 274: add

ITU has been requested to organize in several host countries study programmes on space telecommunications (five fellowship holders in 1973, from three different countries).

Paragraph 295: amend the indicated subparagraphs as follows:

Subparagraphs

- (7) Replace "1 November 1966" with "1972";
- (9) Replace the first line with "Green book of the CCITT, Vth Plenary Assembly, Geneva, 4-15 December 1972";
- (12) Replace with "General Plan for the Development of the Regional Latin American Network, 1974-1976-1980 (Brasilia, 1973)";
- (17) At the end, add: "Each issue contains a list of satellites reported during the past month and data on the utilization of INTELSAT telecommunications satellites.";
- (18) Replace the expression in parentheses with the following: (The twelfth report, dealing with 1972, has appeared; the thirteenth, dealing with 1973, will appear in mid-1974.)

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B. World Meteorological Organization (WMO)

The following text has been submitted to bring up to date the section on WMO of document A/AC.105/100/Add.1.

Research satellites (Paragraph 13)

Nimbus-5 of the United States of America has started daily measurements of the distribution of rainfall over the oceans. This satellite is also providing useful images for correcting maps of the polar ice caps and provides up-to-date information on fast ice and pack ice in Arctic and Antarctic regions even beneath thin cloud layers.

Geostationary Operational Environmental Satellite (GOES) Service (paragraphs 8, 15 (b))

The first satellite in the system of Synchronous Meteorological Satellites (SMS-A) is expected to be launched during May 1974.

First GARP Global Experiment (FGGE) (paragraph 16)

It is expected that the basic satellite observing system for the FGGE will be two polar-orbiting and five geostationary satellites.

The polar-orbiting satellites carrying vertical temperature profile radiometers (VTPR) have excellent prospects of satisfying the Global Experiment's requirements for a minimum of two soundings per grid point per day over 94 per cent of the globe, provided that the temperature error introduced by the presence of an unknown amount of cloud cover in the field of view of the VTPR sensor can be reduced. The Ad Hoc Working Group on Special Observing Systems for the First GARP Global Experiment concluded that there were very good prospects that the error can be reduced to better than 1.5°C.

The accuracy of geostationary satellites will provide visible and infrared images and data collection capabilities covering the entire tropical belt. Images suitable for quantitative analyses are expected to be obtained to at least 40 degrees latitude north and south, and communications coverage are expected to extend at least 70 degrees from each satellite sub-point.

Meteorological Satellite data

WMO's efforts in the field of meteorological satellites have been concentrated on assessing the value of satellite data in predicting the state of the atmosphere and on comparing satellite-derived parameters with similar data obtained by other means. The Commission for Atmospheric Sciences of WMO meeting in November 1973 observed that during the next few years we were likely to see an expanding use of satellite data in weather prediction and in meteorological research.

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The Commission for Atmospheric Sciences reviewed the uses in analysis and prediction of satellite-derived temperature profiles and wind estimates and the techniques employed in verifying these data. Attention was drawn to other potentially useful information which could be applied, such as the evolution of cloud systems viewed by geostationary satellites. The Commission called for continued careful verification studies of satellite-derived data such as temperature and humidity profiles, sea surface temperature estimates and winds assessed from cloud displacement, against conventional in-situ measurements.

Co-operation with other organizations

United Nations/WMO International Symposium on Meteorological Satellites  
(paragraphs 20-23)

The symposium was held in Paris from 21 to 24 May 1973, having been organized by the French National Centre for Space Studies in co-operation with the national Meteorological Service of France and the Dynamic Meteorological Laboratory of the French National Centre for Scientific Research.

WHO/WMO Technical Conference on Observation and Measurement of  
Atmospheric Pollution (TECOFAP) (paragraph 24)

The Technical Conference was held in Helsinki from 30 July to 4 August 1973. Three papers presented concerned measurements from satellites; the proceedings are being published by WHO.

United Nations/WMO Regional Training Seminar on the Interpretation,  
Analysis and Uses of Meteorological Satellite Data

This seminar is planned to be held in Nairobi (Kenya) in September 1974. The purpose is to train participants in the latest methods and techniques for the interpretation analysis and use of data received from meteorological satellites, through a comprehensive series of lectures and laboratory sessions.

Publications and documentation

The following publications which appeared during 1973 contain references to satellite meteorology:

GARP Special Reports

No. 10 - Report on Special Observing Systems for the First GARP Global Experiment.

No. 11 - Report of the fifth session of the Tropical Experiment Board, Geneva, December 1973.

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GARP Atlantic Tropical Experiment (GATE) Reports

GATE Report No. 4 - The Radiation Sub-programme for GATE.

Technical Note

The use of satellite pictures in weather analysis and forecasting. Technical Note No. 124. WMO-No. 333.

World Weather Watch

Sixth status report on implementation. WMO-No. 360.

WMO Bulletin

Vol. XXII, No. 2, pp. 108-110 (Report on Joint UN/WMO Panel and Training Seminar on the uses of meteorological satellite data; Mexico City, 1972).

Tenth Anniversary of the World Weather Watch (WMO-No. 342).

Contains contribution entitled "The impact of outer space technology on developments in meteorology" by D. S. Johnson (United States of America).

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C. United Nations Educational, Scientific and Cultural Organization (UNESCO)

After paragraph 383: insert

The Declaration of Guiding Principles on the Use of Satellite Broadcasting for the Free Flow of Information, the Spread of Education and Greater Cultural Exchange, adopted at the seventeenth General Conference, was communicated to the United Nations for its comments and widely circulated among Member States and the appropriate professional organizations.

A memorandum on the frequencies to be used in satellite broadcasting, dealing particularly with the necessity of an evaluation of long-term television needs in anticipation of ITU planning conferences for satellite broadcasting services, has been prepared with the co-operation of ITU and sent out in July to national commissions, UNDP resident representatives, UNESCO chiefs of mission and interested agencies in Member States. In addition, the document reaffirmed that UNESCO, acting in co-operation with ITU and within the limits of its budgetary resources, was prepared to provide advisory services to countries which requested them.

A study on the use of an Arab regional satellite for purposes of education, information and culture in the service of development, carried out by an expert mission sent in 1972 to 10 Arab countries in order to examine the possibilities and recognize objectives of a space telecommunication system functioning on the basis of regional co-operation, was submitted in July to the countries concerned. In August, at a meeting held at Alexandria by the Arab Telecommunication Union and the Arab States Broadcasting Union, in which representatives of UNESCO and ITU took part, it was decided that UNESCO would send a consultant to determine the needs for educational television in the region.

Following the dispatch of an expert mission to seven countries of West, Central and East Africa in 1972, a preliminary study of an African regional satellite system for education, culture and development was published in July. That report was discussed with the countries of the region at a joint United Nations/UNESCO African Regional Seminar on Satellite Broadcasting Systems for Education and Development, held at Addis Ababa from 22 to 31 October, in collaboration with the Economic Commission for Africa and ITU; there were 31 participants from 23 African countries, 14 speakers and observers from Africa and other regions and 10 representatives of the United Nations and other interested agencies of the United Nations system. UNESCO also presented a document containing a general report on the characteristics and uses of communications satellites and a study of various operating or planned satellite systems. The document draws attention, in particular, to the opportunities afforded by satellite broadcasting for education and development and to the need for regional co-operation.

Work was continued on a broad feasibility study of a regional system of tele-education in South America, approved under the UNDP Special Fund in January 1971, for which UNESCO is the executing agency in association with ITU. Argentina, Bolivia, Chile, Colombia, Ecuador, Paraguay, Peru, Uruguay and Venezuela

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are participating in the project, whose main purpose is the extensive utilization of new teaching techniques made possible by advances in technology and communications, including satellite communications. The second phase of the project, between August 1972 and March 1973, included the sending of 28 international experts to the nine participating countries in order to analyse on the scene, together with about 200 national counterpart workers, the problems, costs and implications of the project, with a view to preparing a draft for a final report which would be considered by a regional tele-education committee and the international organizations concerned at a meeting to be held at Caracas in January 1974, for publication during the first half of 1974.

A study on the use of space communication for education, culture and development, carried out in 1972 at the request of the United Nations Working Group on Direct Broadcast Satellites, has been published. Another study on the socio-cultural impact of satellite television has been prepared by Professor T. Martelanc of the School of Sociology, Political Sciences and Journalism of the University of Ljubljana and will appear in 1974.

A document on co-operation between UNESCO and ITU on telecommunications planning has been prepared for presentation at the Plenipotentiary Conference of the International Telecommunication Union held at Torremolinos-Málaga in September 1973.

The Advisory Group on Space Communications, including seven international experts, held its eighth session at UNESCO headquarters in November. The Group recommended, *inter alia*, continued action by UNESCO for regional and international co-operation and UNESCO assistance in putting into operation any of the regional satellite communications systems which had already been studied in South America, the Arab States and Africa south of the Sahara. Emphasis was placed on professional training and the need for technical assistance in that field.

The Third Committee of Governmental Experts on the Problems in the Field of Copyright and of the Protection of Performers, Producers of Phonograms and Broadcasting Organizations Raised by Transmission Via Space Satellites (convened jointly by the Director-General of UNESCO and the Director General of the World Intellectual Property Organization (WIPO)) met at Nairobi, Kenya, in July 1973 at the invitation of the Government of Kenya. The meeting was held in pursuance of the resolution adopted at Paris in 1972 by the Second Committee of Governmental Experts, and its purpose was to examine the problems referred to in the Committee's title. The report adopted includes as an annex the draft text, as formulated by the Committee, of the proposed convention on the distribution of programme-carrying signals transmitted by satellites.

UNESCO has been represented at the following conferences:

- (a) Twelfth session of the Legal Sub-Committee of the Committee on the Peaceful Uses of Outer Space, held in New York in March-April 1973. UNESCO was interested, in particular, in the following proposals: (1) Convention on principles governing the use by States of artificial earth satellites for direct television broadcasting. (2) Model draft principles governing the use of space technology by States for the study of earth resources.

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(b) Tenth session of the Scientific and Technical Sub-Committee of the Committee on the Peaceful Uses of Outer Space, held in New York in May 1973. The session included the presentation of a statement by the Director-General on UNESCO's interest in the various aspects of the programme in space applications relating to satellite communication and broadcasting and to remote sensing.

(c) Third seminar on "Space and Radiocommunications" of the International Telecommunication Union, held at Le Bourget in May 1973. The representative of UNESCO made reference in his report to the need for evaluating future satellite-broadcasting frequency requirements in the light of the planned development of television services in general.

(d) Fourth session of the Working Group on Direct Broadcast Satellites of the Committee on the Peaceful Uses of Outer Space, held in New York in June 1973. UNESCO submitted a report summarizing its principal activities in the field of satellite communications since the last meeting of the Working Group in May 1970.

The following activities have been undertaken in the Science Sector:

UNESCO was represented at the 16th Plenary Meeting of COSPAR (Konstanz, Federal Republic of Germany, 25 May-5 June 1973) and at the United Nations Technical Panel meeting on the Application of Remote Sensing of Earth Resources (Buenos Aires, Argentina, 3-7 December 1973). In its statements to these meetings UNESCO expressed its interest in the development of the application of space remote sensing to natural resources research, and its readiness to enlarge its participation in the research, training and information aspects of relevant international activities.

Study of principles of space remote sensing has been included in the programmes of UNESCO-sponsored post-graduate courses in integrated studies and rational management of environmental resources for specialists from developing countries in the Netherlands, France and the United Kingdom.

Insert the following after paragraph 387:

An English-language addendum to the (annotated) bibliography UNESCO Publications and Documents Dealing with Space Communication was published in November 1973.

Two other (annotated) bibliographies - Selected List of Studies and Reports on Communication Satellite Projects (in three languages) and An Annotated Bibliography of United Nations Publications and Documents Relating to UNESCO's Activities in the Field of Space Communication (in English) - have been prepared and will be published in early 1974.

After paragraph 388: insert

A report entitled Arab States - Utilization of an Arab Regional Satellite for Education, Information and Culture in the Service of Development, by B. Clergerie, was published in July 1973. It supplements the mission carried out by UNESCO in 1970.

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Another report, entitled Countries of Africa South of the Sahara - Preliminary Study of a Regional Satellite System for Education, Culture and Development, by J. Torfs, A. G. W. Timmers, W. F. K. Coleman and M. von Rundstedt, was also published in July 1973.

A report entitled Study of the Transnational Reception of Educational Television Broadcasts, by Max Egly, has been prepared and will be published in early 1974. This study relates to a simulation operation carried out in 1972 by UNESCO in collaboration with the Cultural and Technical Co-operation Agency in Senegal, Gabon, the People's Republic of the Congo, Dahomey and Tunisia, with the principal purpose of determining a set of characteristics for the form and content of audio-visual educational messages capable of being received in a maximum number of African countries. A document entitled Extracts and Conclusions of a Study Carried Out in Africa by UNESCO and CTCA in 1972, under the direction of Max Egly, was published in October 1973. It is a summary of the above-mentioned final report, intended to serve as a working paper at the Addis Ababa seminar.

An English-language report entitled Satellite Applications for Education, Culture and Development, by D. Smith, was published in July 1973. It concerns the potential of space communications for education, national development and cultural exchange and discusses the cultural and social aspects of satellite systems for the development of communication.

E. World Health Organization (WHO)

The World Health Organization is continuing its review of existing applications in the field of remote sensing. Particular fields of interest comprise the techniques employed to determine vector habitats in relation to such world-wide endemic diseases as malaria, schistosomiasis and trypanosomiasis.

The Symposium on Approaches to Earth Survey Problems through the Use of Space Techniques (Konstanz, 23-25 May 1973) was attended by a WHO representative.

Small-scale pilot studies are being considered to develop appropriate analytical methods for the detection of certain environmental health hazards through the use of multispectral imagery. A number of relevant tasks have been identified for feasibility studies, namely in the fields of mosquito control, snail distribution and microbiological pollution of water.

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G. Inter-Governmental Maritime Consultative Organization (IMCO)

Supplementary information for 1973

1. Taking into account the urgent need to establish an international maritime satellite system, the Maritime Safety Committee instructed initially the Sub-Committee on Radiocommunications and subsequently the Panel of Experts on Maritime Satellites to give detailed and urgent consideration to this matter. As a result of this study, the Maritime Safety Committee decided in March 1973 to recommend that an International Conference of Governments of two-and-a-half weeks' duration be convened in the early part of 1975. The Conference would decide on the principle of setting up an International Maritime Satellite System and, if it accepts this principle, would conclude agreements to give effect to this decision. In view of the various possible institutional and technical alternatives under which an International Maritime Satellite System could operate, a second Conference of Governments might be required. It was agreed that a decision concerning the convening of a second Conference, and its timing, should be left to the discretion of the 1975 Conference. The convening of the Conference was approved by the eighth IMCO Assembly in November 1973 (resolution A.305 (VIII)).
2. The eighth Assembly requested the Maritime Safety Committee to formulate the appropriate provisional agenda of the Conference, having regard to the following list of items:
  - (a) Operational requirements of the System;
  - (b) Over-all basic technical parameters of a first phase System including its interface with the terrestrial networks;
  - (c) Economic assessment of the System, including its cost/benefit to the maritime community;
  - (d) Organizational and institutional arrangements for the establishment of the System, covering inter alia operating, technical, administrative, financial and legal aspects;
  - (e) Consequential action for the development and implementation of the System.
3. By Assembly resolution A/305 (VIII) the Secretary-General was invited to make all the required arrangements for the Conference including the issue of invitations to States, Members of the United Nations, of any of the specialized agencies, of the International Atomic Energy Agency or Parties to the Statute of the International Court of Justice, and to such intergovernmental and non-governmental organizations as are usually invited to send observers to conferences convened by IMCO.
4. The Panel of Experts on Maritime Satellites held two meetings in 1973 and

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gave consideration to the preparatory work for the International Conference on the Establishment of an International Maritime Satellite System.

Future programme and activities

5. The Panel will hold its next sessions in January 1974 and September 1974.

6. At its session in January 1974 the Panel of Experts will prepare a provisional report to the Conference containing the present state of its study. The provisional report will include seven sections i.e.:

Section I - Reasons for establishing a Maritime Satellite System

Section II - Operational requirements of the System

Section III - Sharing possibilities between the Aeronautical Mobile- and Maritime Mobile-Satellite Services

Section IV - Over-all basic technical parameters of a First Phase System

Section V - Channel assignment and terrestrial interface

Section VI - Economic assessment of the System, including its cost/benefit to the maritime community

Section VII - Organizational and institutional arrangements for the establishment of the System

7. When approved by the Maritime Safety Committee in March 1974 the provisional document will be circulated as advance information to Governments and organizations with an invitation to submit comments. Taking into account the comments received the document will be further developed at the Panel's session in September 1974. After which a final document will be prepared for consideration by the Conference.

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I. International Atomic Energy Agency (IAEA)

The following text has been submitted to bring up to date in the Review the section on IAEA (paragraphs 450-459).

(a) Organizational responsibilities

The IAEA divisions responsible for activities relating to the peaceful uses of outer space are the Legal Division; Division of Nuclear Power and Reactors; Division of Nuclear Safety and Environmental Protection, and Division of Research and Laboratories.

(b) Current and future programmes and activities

The IAEA continues to be interested in the legal, environmental and technical problems which have a bearing on its activities liable to arise in connexion with the peaceful use of outer space.

The IAEA will continue to follow the work of the Committee on the Peaceful Uses of Outer Space, particularly that of its Legal Sub-Committee in its deliberations touching upon problems of concern to the Agency.

In order to keep abreast with current developments in the work of the Legal Sub-Committee, the IAEA has been receiving the records of its meetings.

Although the IAEA has not recently been involved in scientific and technical activities directly related to the peaceful uses of outer space, indirect connexions with space affairs exist in the form of Agency interest in unconventional energy conversion systems, such as those employing thermionic and magnetohydrodynamic processes, which are, or are likely to be, involved in propulsion and space power systems. A report on the use of nuclear data in designing space-science experiments was presented at the IAEA Symposium on applications of nuclear data in science and technology, held in Paris in March 1973.

The basic Agency programmes in the biological effects of radiation and radiation safety may also be extended in future to include space environmental problems. The Agency would have a close interest in all measures for preventing any unacceptable radio-active contamination of the earth's atmosphere resulting from the use of nuclear or radioisotopic power generators for space vehicles.

(c) Co-operation with other organizations

The IAEA co-operates with OECD (NEA) in the field of magnetohydrodynamics and thermionic processes in the form of joint liaison groups.

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