UNITED NATIONS

Sixth Session of the Group of Experts
on Geographical Names
New York, 5-26 March 1975

Informative report by A.M. Komkov (USSR), Chairman of the Working Group on the names of extraterrestrial topographic features

Significant progress in space investigation has been achieved in the period between the 5th and present sessions of the UN Group of Experts on geographical names (March 1973 - March 1975). The successful performance of space research programs in the USSR, USA and other countries resulted in the accumulation of new data that allow for the mapping of not only the Moon but also of some distant planets of the Solar system, viz. Mars, Mercury, and Venus. The names of topographic features are a necessary component element of this kind of map as well as of any other publication that supplies information on definite extraterrestrial topographic features. The need of proper names for the above-mentioned elements is constantly increasing. Therefore the problems of nomination of extraterrestrial topographic features become ever more pressing. The commissions of the International Astronomical Union (IAU) are still working on their solution.

Persuant to the recommendations of the 5th session of the Group of Experts we prepared a special letter informing the Executive Committee of the IAU about our discussions on the problems of nomination of extraterrestrial features and the resolutions adopted by the 5th session of the Group and the London 1972 Conference. This letter of August 14, 1973 (Annex I) signed by Mr. M.F. Burrill, Chairman of the Group of Experts was forwarded to Prof. B.Strömgren, the IAU President and Prof. Dr. C.de Jager, the IAU General Secretary. The letter not only informed the IAU Executive Committee about the UN activities but also invited the IAU to collaborate in this field. Unfortunately, our proposal did not meet with any response. Prof. C.de Jager in his brief reply of August 21, 1973 (Annex II) mentioned that the IAU had been dealing with the lunar nomenclature since 1930 and pointed out that the recently compiled draft list of names for a great number of lunar surface formations had been approved by the IAU General Assembly and would "... be accepted as a standard by all the scientists of Earth".

The XVth General Assembly of the IAU (Sydney, Australia,

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August 1973) indeed approved a number of proposals of Commission 17 concerning the lunar nomenclature. The system of sheet designation for the NASA lunar map series on the scales of 1:1,000,000 and 1:250,000 was approved as well. Recommendations concerning (a) the gradual substitution of proper names for letter suffixes for minor craters, (b) the introduction of new generics for mountain ranges and other landforms, (c) the naming of craters not only after outstanding scientists but also after men of art and culture (writers, artists, musicians and the like) were also adopted.

The IAU General Assembly also approved the suggestions of Commission 16 concerning the Martian nomenclature. Classical names that had earlier been applied to the Martian provinces differing in albedo should preferably be used to designate the sheets of the 1:5,000,000 map issued by the USA Geological Survey, since the boundaries of these provinces are very vague. Craters with diameters of over 20 km should preferably be given two-letter designations from Aa to Zz in increasing order of longitude and latitude of the feature designated. Craters with diameters of over 100 km should be named after distinguished scientists that contributed to the investigation of Mars. In this connexion a list of more than 180 craters named after deceased scientists was approved. Classical names previously applied to the Martian provinces and not used for the sheet designation of the 1:5,000,000 map series may be used in naming ranges, mountains, canyons, valleys and the like.

Due to the lack of co-ordination between the IAU commissions the recommendations adopted by the IAU General Assembly on their suggestions disagreed with one another. For example, more than the half of the 180 names approved by the Assembly for Martian craters duplicate the lunar crater names approved earlier.

In order to go on with the work on the nomination of extraterrestrial topographic features the IAU has formed several task groups for the nomenclature of individual planetary

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bodies: the Moon, Mars, Mercury, Venus and Jupiter as well as a Joint Working Group for Planetary System Nomenclature. This Working Group under the chairmanship of Dr. P. Millman held its first meeting in June, 1974 in Ottawa and adopted a number of resolutions (Annex III - Minutes of the First Meeting of the IAU/WGPSN, June 27-28, 1974). Among them, resolutions that approve the basic principles for planetary system nomenclature, Latin terms to be used for different types of features, and possible name categories for use in the lunar and other planet nomenclature can be found. The first drafts of these resolutions were elaborated at the Moscow Conference held in April 2-5, 1974, American and Soviet members of the IAU Working Group participated in it. (Annex IV - The Report of the Moscow Conference on Lunar and Planetary Nomenclature, April 2-5, 1974). The Ottawa session of the IAU Working Group also approved a number of proposals on individual planet nomenclature suggested by the Chairmen of the Task Groups and submitted them to the Executive Committee for subsequent approval.

The name categories of different types of topographic features in different planetary bodies, those in use and those recommended for use can be found in different documents. After all the name categories were put together in a table (Annex V) it was revealed that a system as such actually does not exist. Different name categories are either given to or suggested for similar topographic features, or vice versa, the names of the same category are either given to or suggested for dissimilar topographic features.

The necessity to normalize the general system of naming extraterrestrial topographic features is quite evident. To achieve this, definite recommendations should be elaborated in addition to the basic principles for the planetary system nomenclature adopted by the IAU Working Group, such as: which name categories or other kinds of designation should be assigned to any particular type of topographic feature in any given planet. It is rather dangerous to adopt any recommendation on

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the naming of individual features of any planet unless a co-ordinated nomenclature system for topographic features of the planets, those under investigation or those to be investigated, is elaborated. There will be mistakes, they are inevitable and in the future it will be extremely difficult to get rid of them. But if we have a general co-ordinated planetary system nomenclature the elaboration of various sub-systems for individual planets will be much more successful.

It is extremely important that such a system be generally recognized, i.e. accepted as a standard not only on a national but also on an international basis. Here, along with scientific and technical difficulties, juridical problems - problems of international law are involved. The elaboration of such a system is a very complicated one the successful performance of which is possible exclusively on the basis of the international collaboration of scientists and experts in the various branches of knowledge - astronomers, geophysicists, geodesists, cartographers, linguists, lawyers and others.

Our primary aim is to establish permanent task contacts between the IAU Working Groups (for the planetary system nomenclature) and that of the United Nations (on the names of extraterrestrial topographic features). A second meeting of Dr. P.Millman's Working Group to be held in Moscow in July, 1975 will present a favourable opportunity for this.

On our part material on a comparative analysis of the existent and suggested methods of designation of extraterrestrial topographic features can be prepared for this meeting as well as our proposals concerning the development of a system of such designations co-ordinated for different planets. Necessary juridical consultations on the preparation and conclusion of an international agreement regulating the procedure of the approval of names for extraterrestrial topographic features will by that time also terminate.

UNITED NATIONS NATIONS UNIES

GROUP OF EXPERTS ON GEOGRAPHICAL NAMES

Meredith F. Burrill, Chairman
5503 Grove Street
Chevy Chase, Maryland 20015, U.S.A.

August 14, 1973

President B. Strömgren and
General Secretary C. de Jagger
International Astronomical Union
Space Research Laboratory
The Astronomical Institute
21 Benelux Laan
Utrecht, Netherlands

Gentlemen:

At its fifth session on 5-16 March 1973, our Group of Experts continued its discussions of extraterrestial naming in relation to the overall U.N. program of cooperation in international standardization of names. The report of its Working Group on Extraterrestial Topographic Features, Annex III to the report of that session (ESA/RT/C/GN/3), is enclosure A to this letter, which constitutes the status report to IAU referred to in paragraph 18, p. 24.

The Group of Experts "acknowledged that contacts with scientific organizations such as the International Astronomical Union and the International Committee on Ouomastic Sciences might be improved. It was the general feeling that ultimate responsibility for the methods employed in name giving ought to lay with United Nations bodies because of their international standing. All organizations that are occupied in name giving should be aware of this." (ESA/RT/C/GN/3, para 25, p. 8).

Resolution 21 of the London Conference, referred to in paragraph 17 of Enclosure A, was worded as follows:

The Conference

Having discussed the present situation with regard to the naming of extraterrestial topographic features.

Recognizing that greatly increased lunar and planetary exploration, study and associated detailed large-scale mapping require a new perspective on the naming of extraterrestial features and a wider base for international agreement,

Recommends that the United Nations Group of Experts on Geographical Names study the question of drafting an international convention on the standardization of extraterrestial nomenclature, in cooperation with other competent international bodies.

Informal discussions with the Department of State in Washington indicate that international conventions are acceptable devices for dealing with such situations. The next question concerns the authority of national name standardizing bodies to deal with extraterrestial names.

The U.N. name standardization program is based on international acceptance of names standardized by the nationally constituted authority. In the United States, by statute, the rulings of the Board on Geographic Names, commonly referred to as BGN, are required usage in the Federal Government. However, the act did not say explicitly whether "geographic names" include those of extraterrestial entities. A legal opinion is therefore being sought. After this point is cleared up it will be possible to lay out procedures in a draft of an international convention.

A convention would presumably cover both policy and procedure. Policy would identify both broad categories of names or other words deemed appropriate or inappropriate for the specific element in extraterrestial names, and a subsequently expandable basic set of standard words to use as generic terms designating the kind of entity named. The policy would presumably be designed to apply in all extraterrestrial naming as far as practicable. Procedure would cover such matters as steps to be taken in proposing names, kinds of information to be adduced in support of proposals, opportunity for others interested to comment, notification of naming, and maintenance of a central name repository. It would presumably say something about languages and rendering of names into writing systems other than that of the original naming.

The current approach of the Group of Experts to undersea and Antarctic names is through uniform or closely similar naming policies, notification of intention to name accompanied by invitation to comment,

informal resolution of differences or duplications, and prompt dissemination of name actions. The approach is one of cooperation on an informal basis.

The Group of Experts considers it important that as far as possible divergent points of view should be brought out and resolved as far as possible at the early stages in policy formulation. We therefore invite full exchange of ideas and arguments before policy and procedure become too solidified.

Copies of this letter and enclosures are being forwarded in care of A. J. Higgs of the Local Organizing Committee in Epping, Australia, and to A. M. Komkov who suggested the essential content of the letter.

Sincerely,

Meredith F. Burrill

Annex II

XV GENERAL ASSEMBLY
SYDNEY, 21-30 AUGUST, 1973

Local Organising Committee
C.S.I.R.O. Radiophysics Laboratory
P.O. Box 76
Epping, Australia 2121

Sydney, 21 August 1973

Dr. A. Komkov
Chief of the United Nations Committee for
Geographical Nomenclature
c/o United Nations Outer Space Affairs Division
United Nations
New York N.Y.
USA.

Dear Dr. Komkov,

You may be aware of the intensive work done since 1930 by the International Astronomical Union in the field of lunar nomenclature.
This work, for a great deal done in cooperation with the other international organizations involved, has recently resulted in the establishment of a detailed proposal for the naming of many lunar formations.
This proposal, being backed by the various interested international organizations of the Inter Union Commission of Scientific Unions, has now also been accepted by the General Assembly of the International Astronomical Union. The naming, as proposed will be used in the large lunar maps, at this time being, printed by NASA, and will be accepted as a standard by all scientists of our Earth. We shall be happy to send you a set of the maps as soon as these are printed.
At the same time, the International Astronomical Union, in close cooperation with the other organizations of the ICSU family, is now continuing its work with regard to the nomenclature of various other bodies of our planetary system.

Very sincerely yours,

Prof. Dr. C. de Jager,
Secretary General of the
International Astronomical Union.

Burrill took with him to Australia

Annex II

To Mr. A. M. Komkov, for information

P. M. Millman
13.12.74

Minutes of the First Meeting
of
The I.A.U. Working Group for Planetary System Nomenclature

held in the

Council Chamber, Building M58, National Research Council of Canada
Ottawa, Ontario

June 27 and 28, 1974

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Members present* - Peter M. Millman, Ottawa, Ontario - Chairman
Audouin Dollfus, Meudon, France
Boris Ju. Levin, Moscow, USSR
Cornell H. Mayer, Washington, D.C., USA
Donald H. Menzel, Cambridge, Mass., USA
David D. Morrison, Honolulu, Hawaii, USA
Tobias C. Owen, Stony Brook, N.Y., USA
Gordon H. Pettengill, Cambridge, Mass., USA
Bradford A. Smith, Las Cruces, N.M., USA

Member absent - S. Kieth Runcorn, Newcastle-upon-Tyne, UK

Guest - John D. Keys, Assistant Vice-President of Laboratories, N.R.C.C., Ottawa

The Chairman introduced Dr. J.D. Keys, Vice-President of the National Research Council, who welcomed the members of the working group to Ottawa. He said he was glad this location had been chosen for the meeting, and noted that the Council was sixty years old, having been established during the First World War. Funded by the government, the Council was established to develop science in Canada and now there were over 3,000 people on staff, one third of whom were professionals. He pointed out that the National Research Council had a great interest in astronomy, and was involved in the setting-up of the Canada-France-Hawaii telescope project on Mauna Kea in the island of Hawaii.

The Chairman thanked Dr. Keys for opening the meeting.

* Levin and Pettengill arrived late but were present before any resolutions were worded. Menzel, Owen and Pettengill left before the sessions ended on June 28, but empowered the six members remaining to act as a quorum.

NOTE - Added in October, 1974 - The ten resolutions in Appendix A of these minutes were approved by the Executive Committee of the I.A.U. at their meeting in August, 1974. Peter M. Millman

1. In his introductory remarks the Chairman noted that this was the first time an official international group had met to discuss topographical nomenclature on a broad basis for the whole solar system. Since new ground was being broken it was necessary at the start to formulate very general guide lines to be followed in the future by both the IAU/WGPSN and the individual task groups. It had been requested by the Executive Officers of the I.A.U. that the WGPSN provide some specific resolutions on nomenclature, which could then be submitted to the Executive Committee of the I.A.U., scheduled to meet in France during August, 1974. It was pointed out that, unlike other working groups in the I.A.U., the WGPSN reports directly to the I.A.U. Executive and not through one of the commissions. This present meeting had been structured so that all members could give reports and make comments before the Working Group decided on the final wording of the resolutions to be put forward.

There was some general discussion concerning the importance of making decisions truly international and of arranging nomenclature meetings in various countries and of announcing the dates well in advance. We should aim at having all planetary topographic maps distributed to the concerned members of both the Working Group and the Task Groups as soon as possible after they are printed. Owen noted that the People's Republic of China was not officially included in I.A.U. deliberations at the present time. Menzel mentioned that he had been invited to visit Peking for the purpose of giving lectures in China and that while there he would ask for Chinese names to use in solar system nomenclature. The Working Group considered this an excellent way for making contact with the Chinese scientists on an informal basis.

2. The report of the Moscow Conference on Lunar and Planetary Nomenclature, held April 2 - 5, 1974, was now discussed in detail. After various minor changes in wording and emphasis had been suggested the meeting expressed general approval for the basic philosophy of this report.

3. The Chairman reported on the current situation in regard to the Working Group on the Names of Extraterrestrial Topographic Features formed by the Group of Experts on Geographic Names, which in turn reports to the United Nations Economic and Social Council (ECOSOC). During the last six months informal and unofficial conversations had taken place between various astronomers and geologists interested in nomenclature, and members of the United Nations Group of Experts on Geographic Names from several countries. It would seem that there is no immediate problem here as it has been generally agreed on a completely informal basis that the I.A.U. is the best-equipped international agency to formulate the details of topographic nomenclature on planetary bodies. If, when this has been done, the United Nations wish to approve a given nomenclature system, it only strengthens its use over a much wider spectrum of nations than those that belong to the I.A.U. The important factor is for the I.A.U. to remain active in this field and to provide adequate nomenclature systems as they are required.

Informal contact has also been established with the International Committee for Outer Space Onomastics, with headquarters in Grand Forks, N.D., U.S.A. This is an international organization of professors who are experts in the science of the origins and forms of words, in particular of the proper names of persons and places. Members of this group are available for consultation and will be happy to cooperate with the IAU/WGPSN.

4. Reports from the chairmen of the various task groups were now called for. The question of the official approval of the membership in the task groups was raised and the general opinion was expressed that the WGPSN should give this approval and keep the General Secretary of the IAU informed of all action re task-group membership. When consulted by phone Dr. Contopoulos agreed that this was a logical suggestion and he promised to bring the matter up at the Executive Committee meeting in August.

THE MOON Menzel reviewed the history of the Task Group for Lunar Nomenclature (formerly the Working Group - Lunar Nomenclature). He noted that there had been considerable disagreement within the Group concerning the categories of names to be applied to lunar craters but that at the XV General Assembly of the IAU in Sydney, Australia, Commission 17 voted unanimously to permit non-scientific name categories to be used on the moon. As a result a number* of names of deceased non-scientists had been printed provisionally on the 1:250,000 series of lunar maps being produced by NASA in Washington, D.C.

Since there will be 2304 map sheets in the 1:250,000 series, and 144 sheets in the 1:1,000,000 series, 2448 sheet names alone will be needed. The eventual requirement will be between 6000 and 7000 names, on the basis of 2 or 3 crater names per sheet. Menzel noted that he had been requested by the IAU Executive to add no further provisional names of non-scientists to the lunar map sheets until the overall requirements for nomenclature in the solar system could be reviewed by the IAU/WGPSN and by the IAU Executive Committee. He made a strong plea for the continued use of the names of non-scientists on the moon since they were new scraping the "bottom of the barrel" in a search for suitable scientific names. A letter from Farouk El-Baz was read pointing out that the use of some names on the moon from the non-scientist category was a practice hallowed by tradition.

* The exact break-down of the total number of provisional names added since the General Assembly and prior to the Lunar Task Group meeting in Washington in May, 1974 was noted as -

Non-scientists	60
Scientists	23
Earth scientists	31
Sheet names	3
	117

Owen suggested that the mapping agencies in the USSR, the USA and other countries be requested by the IAU to announce mapping schedules far enough in advance to make possible the provision of an approved nomenclature system.

Dollfus noted that the Inter-Union Commission for Lunar Studies had the responsibility for correlating lunar research among the various international unions and that members of any union could apply to this Commission for information concerning the activities of other unions in the field of lunar studies. There is now a proposal to form an Inter-Union Commission on the Planetary System, and this matter will be discussed at the next meeting of I.C.S.U.

5. MERCURY Morrison reported on the Task Group for Mercury Nomenclature and said that his group had held two meetings, in November, 1973 and March, 1974. The classical nomenclature referred to albedo features which frequently do not correspond to topographic features. As a result of the Mariner 10 observations the Mercury Group is now dealing with 16 quadrangle maps and the immediate need is for names for 53 craters, 2 valleys, 2 scarps, 2 mountain chains and 8 plains. These should be made available within two months to the U.S. Geological Survey, the agency printing the maps. Dollfus suggested that about 12 classical names could well be used for the principal albedo features on Mercury, or as sheet names.

6. VENUS Pettengill, in reporting for the Task Group on Venus Nomenclature, noted that we now have 50-km resolution on half the surface of Venus and 10-km resolution for one per cent of the surface. By 1975/77 we should have 5-km resolution over half the planet. He felt that it was still a little premature to make firm decisions on nomenclature for Venus but rather favored the approach of using name categories in some way connected with women.

7. MARS Smith distributed a detailed written report on the history, previous action and present requirements of Martian nomenclature. The current mapping system is based on 30 geometrical areas, or "quadrangles", covering the entire planet on a scale 1:5,000,000. Each map sheet is designated by the name of a prominent classical albedo feature. All craters larger than 20 km, roughly 6000 in number, are assigned a two-letter designation. Craters larger than 100 km have been named after prominent deceased individuals, and 13 other classes of topographic feature have received approved names. There was considerable duplication with the lunar nomenclature and such duplication should be avoided in the future, as far as possible.

Smith then outlined a number of new proposals requiring action by his Task Group and the WGPSN in the near future.

8. JUPITER Owen suggested that the Task Group for Jupiter Nomenclature could well include all the planets and satellites in the outer solar system beyond the asteroid belt. Many of the nomenclature problems to be faced on Jupiter were duplicated on the other outer planets. He felt that there were four primary jobs concerning nomenclature in the outer solar system.

(a) Names for the numbered satellites of Jupiter.

(b) A decision about naming any new satellites discovered in the outer solar system.

(c) A uniform set of terms for features in the cloud belts on the outer planets.

(d) Nomenclature and terminology in the ring system of Saturn.

9. The Working Group now considered the formulation of general guide lines for planetary system nomenclature.

(To simplify referencing, all resolutions approved by the WGPSN for submission to the IAU Executive Committee have been identified by Roman numerals and have been listed together in Appendix A to these minutes.)

Resolution I Moved by Owen, seconded by Morrison and carried unanimously.

Resolution II Moved by Owen, seconded by Smith and carried unanimously.

Resolution III There was a long discussion on the relative merits of various name categories and on the value of imposing detailed restrictions on the use of certain types of names. Finally, the meeting agreed that general guide lines should be just that, and that if doubt existed about a specific name or name category this could be argued at the time the name or category was proposed for use in a given case. After various votes on amendments, which were defeated, Resolution III as moved by Morrison, seconded by Owen, was carried.

The above three resolutions evolved directly out of the report of the Moscow Conference.

Resolution IV Moved by Smith, seconded by Morrison and carried unanimously.

Resolution V Moved by Menzel, seconded by Smith and carried unanimously.

Resolution VI Moved by Menzel, seconded by Pettengill and carried unanimously.

10. The following resolutions were passed in response to requests from the various Task Groups.

Resolution VII The current situation in providing names to NASA for the 1:250,000 lunar map series was surveyed. It was stated that NASA has immediate plans for completing the printing of a total of 176 sheets in this series and that roughly 100 new names would be required for this operation, in addition to the names already supplied. Menzel also noted that perhaps 2000 new names would be needed soon when the 1:5,000,000 series of lunar maps was revised. He strongly recommended that the future assignment of names for the moon include the names of non-scientists as well as scientists. Levin opposed the use of the names of non-scientists on the moon, in view of the large number of other planetary bodies in the solar system which would eventually require nomenclature systems. He felt it would be unfortunate if we used up all the good categories of personal names on the moon, leaving none for the other planets. He mentioned that he had no objections to including disciplines such as engineers, archaeologists, anthropologists and possibly historians in the general category of scientists. After some discussion Menzel agreed that some 1000 additional names of scientists could probably be found by searching in disciplines that had not yet been used extensively in lunar nomenclature.

In view of the fact that Task Groups other than the Lunar Task Group had not yet had time to survey their requirements in detail Resolution VII was moved by Smith, seconded by Owen and carried.

Resolution VIII Morrison presented seven recommendations for which the Task Group on Mercury Nomenclature desired WGPSN approval. After some discussion and minor modifications, Resolution VIII was moved by Morrison, seconded by Smith and carried unanimously.

Smith presented six proposals from the Task Group for Mars Nomenclature. Dollfus recommended that these be tabled for future discussion. It was agreed to do this in the case of four of the proposals, since they had only been under discussion for about a month. Smith noted that the other two proposals had been before the Task Group for at least several months, and these were now acted on.

Resolution IX Moved by Smith, seconded by Morrison and carried unanimously.

Resolution X After some discussion this was moved by Smith, seconded by Morrison and carried.

11. The full membership in the IAU/WGPSN, as approved by the IAU Executive Committee, is attached for information as Appendix B to these minutes. The complete membership in all the Task Groups has not yet been officially approved.

12. It was agreed that the second meeting of the IAU/WGPSN would be held approximately one year after the first meeting, and in the U.S.S.R., if this could be arranged. Levin was asked to explore the possibilities for the exact time and place of this meeting.

13. The meeting adjourned at 20.00 hrs, June 28, 1974.

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Appendix A to Minutes of the First Meeting of the I.A.U. Working Group for Planetary System Nomenclature, Ottawa, Ont., June 27 and 28, 1974.

RESOLUTION I - Basic Principles for Planetary System Nomenclature

(a) Nomenclature is a tool and the first consideration shall be to make it simple, clear and unambiguous.

(b) The number of names chosen for each body should be kept to a minimum, and governed by the anticipated requirements of the scientific community.

(c) Although there will be exceptions, duplication of the same name on two or more bodies should be avoided.

(d) In general, individual names chosen should be single words, and expressed in the language of origin. Transliteration and pronunciation for various alphabets should be given, but there will be no translation from one language to another.

(e) Where possible, consideration should also be given to the traditional aspects of any nomenclature system, provided that this does not cause confusion.

(f) Solar system nomenclature shall be international in its choice of names. Recommendations submitted by I.A.U. National Committees will be considered. Final approval of any selection is the responsibility of the International Astronomical Union.

(g) We must look to the future in general discussions of solar system nomenclature and attempt to lay the groundwork for future requirements that will result from the development of the space program.

RESOLUTION II - Latin Terms for Different Types of Features, to be used in Planetary System Nomenclature

The following Latin terms, already approved for use on the moon or Mars, are suitable for use with a nomenclature system on any planet or satellite in the solar system (plurals are given in brackets):-

Latin Term	Approximate Description
(a) CATENA (Catenae)	a chain or line of craters
(b) CHASMA (Chasmata)	a deep, elongated, steep-sided depression
(c) CRATER (Craters)	an essentially circular depression
(d) DORSUM (Dorsa)	a ridge
(e) FOSSA (Fossae)	a long, narrow, shallow depression
(f) LABYRINTHUS (Labyrinthi)	a complex of intersecting narrow depressions
(g) MENSA (Mensae)	a flat-topped prominence with cliff-like edges
(h) MONS (Montes)	a mountain
(i) PATERA (Paterae)	an irregular crater, or a complex one with scalloped edges
(j) PLANITIA (Planitiae)	a plain
(k) PLANUM (Plana)	a plateau
(l) RIMA (Rimae)	a fissure
(m) RUPES (Rupes)	a scarp
(n) THOLUS (Tholi)	a hill
(o) VALLIS (Valles)	a valley
(p) VASTITAS (Vastitates)	an extensive plain

When required, additional Latin terms may be added to this list, but it is recommended that the number of terms used be kept to a minimum. The following terms, already in use on the moon, should be discussed in each case before being used on other planetary bodies:-

(q) LACUS (Lacus)
(r) MARE (Maria)
(s) PALUS (Paludes)
(t) PROMONTORIUM (Promontoria)
(u) SINUS (Sinus)

RESOLUTION III - Possible Name Categories for use in Planetary System Nomenclature

Traditionally, the names of distinguished, deceased scientists have generally been used to name craters on the moon and Mars. Although this source can still be used it is obvious, when we examine the future requirements of planetary system nomenclature, and particularly for the case of the other planets and satellites, that we should consider the possibility of using additional name categories.

Recommendations concerning the name categories for any planet and its satellites shall be approved by the Working Group for Planetary System Nomenclature before the individual names are assigned by the Task Group concerned. Task groups shall operate in compliance with Resolution I. It is agreed to prohibit the assignment of names of individuals known primarily - as religious figures;
- as military leaders, political leaders, and philosophers of the 19th and 20th centuries.

Some examples of name categories that can, without difficulty, provide several hundred names, and in some cases considerably more, are:-

(a) distinguished, deceased - artists (painters)
(b) " " - musicians
(c) " " - sculptors
(d) " " - writers and poets

Where names of specific individuals are used the dates of birth and death, and very brief biographical details, should be published.

(e) animals
(f) birds
(g) cities
(h) first names of men and women
(i) islands
(j) lakes
(k) minerals
(l) mountains
(m) rivers
(n) villages

Some examples of name categories capable of providing less than one hundred names are:-

(o) deserts
(p) fundamental particles
(q) geographical provinces
(r) observatories
(s) scientific instruments
(t) ships of discovery
(u) the name of the particular planet or satellite in various languages

The preceding lists should in no way be considered restrictive.

Eventually, we may have to consider the surface nomenclature for a total of more than thirty different planetary bodies. Hence, the choice of name categories should be made with this in mind.

RESOLUTION IV - Schedules for Map Production

The development of lists of names for various bodies in the solar system is an important but time-consuming task that must involve a cooperative effort by representatives of several countries. To avoid decisions hastily made to satisfy contractual deadlines or mission constraints, it is essential that the nomenclature task groups be made aware of these requirements well in advance.

We therefore request the Executive Committee of the I.A.U. to notify those organizations that may be responsible for production of maps of solar-system bodies (e.g. NASA), asking them to inform the IAU/WGPSN of any plans for mapping that will involve deadlines for the availability of names. The IAU/WGPSN should also receive advance notice of any missions that may involve landing sites or areas of reconnaissance requiring special nomenclature.

RESOLUTION V - Advance Notice of Meetings

Working Group meetings and Task Group meetings should be scheduled at least six months in advance, if at all possible. When convenient, such meetings might be scheduled in conjunction with international meetings which a majority of members are likely to attend.

RESOLUTION VI - Procedures in Task Groups

Task-group members unable to attend meetings shall be contacted by the Chairman regarding concurrence in the choice of names. Adequate documentation shall be provided. Lack of response within 45 days (allowed for two-way mail or wire service) shall be regarded as concurrence.

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RESOLUTION VII - Lunar Mapping

Until the next meeting of the IAU/WGPSN, approximately one year from June, 1974, names of non-scientists shall not be chosen for lunar maps.

RESOLUTION VIII - Nomenclature for Mercury

(a) The classical nomenclature, as used by E.M. Antoniadi, will be adopted for regional names and albedo features but probably not for topographic features.

(b) A maximum of six features will be named for deceased scientists who have made exceptional contributions to the study of this planet.

(c) The craters may be named for birds of the world, or for cities of the world.

(d) Other features may be named for (i) ships of discovery, (ii) names of Mercury or associated with Mercury in various languages, (iii) observatories.

(e) A shorthand notation, similar to that used for Mars, will be sought as a potential means for designating small craters on Mercury.

(f) A Latin term will be chosen for the class of geological feature called in English a "basin".

(g) The following three names, already in provisional use, are approved - Kuiper
Caloris
Hun kal.

RESOLUTION IX - Nomenclature for Mars

The names Kuiper and Vishniac are approved for craters at the following locations:-

Kuiper, G.P.	long.	15°	lat.	-5°
Vishniac, W.		275		-7°

RESOLUTION X - Nomenclature for Mars

On the 1:1,000,000 and 1:250,000 series maps of Mars a system is proposed for naming the previously undesignated craters of approximately 5-20 km diameter, and craters 20-100 km in size which have double-letter designations. Names for these craters have been chosen from a list of small towns and villages of the world. Criteria used in compiling the list of names were - (i) names of three or less syllables which are easy to pronounce, (ii) worldwide representation, (iii) names limited to small towns or villages. Two and three syllable names are proposed for 10-20 km undesignated craters and 20-100 km double-lettered craters on the 1:1,000,000 maps; one syllable names are proposed for very small (5-10 km) craters on the 1:250,000 maps. We do not propose at the present time to name the other 6000 double-lettered craters on Mars, but feel that, within the small landing site areas, named craters would be more meaningful as reference points than lettered craters.

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Annex IV

To Mr. A. M. Komkov, for information P. M. Millman 13.12.74

MOSCOW CONFERENCE
on
LUNAR and PLANETARY NOMENCLATURE
April 2 - 5, 1974

Present:-

Academician A.P. Vinogradov -
Vice-President, Academy of Sciences, USSR; Chairman, Commission for Lunar Nomenclature, Academy of Sciences, USSR.

Corresponding Member, Academy of Sciences, USSR E.R. Mustel -
Member, Commission for Lunar Nomenclature, Academy of Sciences, USSR; Chairman, Astronomical Council, Academy of Sciences, USSR; Vice-President, International Astronomical Union.

Dr. B.Yu. Levin -
Member, Commission for Lunar Nomenclature, Academy of Sciences, USSR; Proposed Member, IAU Working Group for Planetary System Nomenclature.

Dr. K.P. Florenskij -
Vice-President, IAU Commission 17; Member, IAU Task Group for Lunar Nomenclature.

Dr. P.M. Millman -
President, IAU Working Group for Planetary System Nomenclature.

Dr. B.A. Smith -
Member, IAU Working Group for Planetary System Nomenclature; Chairman, IAU Task Group for Mars Nomenclature; Member, IAU Task Group for Mercury Nomenclature.

Mr. I.P. Starostin -
External Relations Directorate, Academy of Sciences, USSR.

Academician Vinogradov expressed cordial words of welcome on behalf of the Academy of Sciences of the USSR at the opening session of this conference.

1. Basic Principles for Planetary System Nomenclature

The following basic principles were unanimously approved:-

(a) Nomenclature is a tool and the first consideration shall be to make it simple, clear and unambiguous.

(b) Where possible, consideration should also be given to the traditional aspects of any nomenclature system, provided that this does not cause confusion.

(c) Solar system nomenclature shall be international in its choice of names and based on the recommendations of IAU National Committees. However, approval of any selection shall be given by the International Astronomical Union.

(d) In general discussions of solar system nomenclature we must look to the future, and attempt to lay the groundwork for future requirements that will result from the development of the space program.

2. Latin Terms for Different Types of Features, to be used in Planetary System Nomenclature

The following Latin terms, already approved for use on the moon or Mars, are suitable for use with a nomenclature system on any planet or satellite in the solar system (plurals are given in brackets):-

Latin Term	Approximate Description
(a) CATENA(Catenae)	a chain or line of craters,
(b) CHASMA(Chasmata)	a deep, elongated, steep-sided depression,
(c) CRATER(Craters)	an essentially circular depression,
(d) DORSUM(Dorsa)	a ridge,
(e) FOSSA(Fossae)	a long, narrow, shallow depression,
(f) LABYRINTHUS(Labyrinthi)	a complex of intersecting narrow depressions,
(g) MENSA(Mensae)	a flat-topped prominence with cliff-like edges,
(h) MONS(Montes)	a mountain,
(i) PATERA(Paterae)	an irregular crater, or a complex one with scalloped edges,
(j) PLANITIA(Planitiae)	a plain,
(k) PLANUM(Plana)	a plateau,
(l) RIMA(Rimae)	a fissure,
(m) RUPES(Rupes)	a scarp,
(n) THOLUS(Tholi)	a hill,
(o) VALLIS(Valles)	a valley,
(p) VASTITAS(Vastitates)	an extensive plain.

When required, additional Latin terms may be added to this list. The following terms, already in use on the moon, should be discussed again before being used on other planetary bodies:-

(q) LACUS(Lacus)
(r) MARE(Maria)
(s) PALUS(Paludes)
(t) PROMONTORIUM(Promontoria)
(u) SINUS(Sinus)

3. Possible Name Categories for use in Planetary System Nomenclature

Traditionally, the names of distinguished, deceased scientists have generally been used to name craters on the moon and Mars. Although this source can still be used it is obvious, when we examine the future requirements of planetary system nomenclature, and particularly for the case of the other planets and satellites, that we should consider the possibility of using additional name categories.

Recommendations concerning the name categories for any planet and its satellites shall be approved by the Working Group for Planetary System Nomenclature before the individual names are assigned by the Task Group concerned. Task groups shall operate in compliance with Item 1 in this report. It is agreed to prohibit the assignment of names of individuals known primarily - as religious figures;
- as military leaders, political leaders, and philosophers of the 19th and 20th centuries.

Examples of name categories that can, without difficulty, provide several hundred names, and in some cases considerably more, are:-

(a) distinguished, deceased - artists(painters)
(b) - muscians
(c) - sculptors
(d) - writers and poets

(Where names of specific individuals are used the dates of birth and death, and very brief biographical details, should be published.)

(e) animals
(f) birds
(g) cities
(h) first names of men and women
(i) islands
(j) lakes
(k) minerals
(l) mountains
(m) rivers
(n) villages.

Examples of name categories suitable for providing less than one hundred names are:-

(o) deserts
(p) fundamental particles
(q) geographical provinces
(r) observatories
(s) scientific instruments
(t) ships of discovery
(u) the name of the particular planet or satellite in various languages.

Eventually, we may have to consider the surface nomenclature for a total of more than thirty different planetary bodies. Hence, the choice of name categories should be made with this in mind.

In general, individual names chosen should be single words, and expressed in the language of origin. Transliteration and pronounciation for various alphabets should be given, but there will be no translation from one language to another. In some name categories it may be expedient to use Latin names. Although there will be exceptions, duplication of the same name on two or more bodies should be avoided as much as possible. The number of names chosen for each body should be kept to a minimum, and governed by the anticipated requirements of the scientific community.

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