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Extraterrestrial Topographic Features

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Concerning the names of Extraterrestrial Topographic Features

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Group of Experts on the Geographic Names  
Working Group on the Extraterrestrial Topographic  
Features

CONCERNING THE NAMES OF EXTRATERRESTRIAL TOPOGRAPHIC  
FEATURES

The UN Ad Hoc Group of Experts on geographic names at its second meeting in New York (March, 10-20, 1970) adopted the recommendation to form a special working group on the names of extraterrestrial topographic features (UN Paper ESA/RT/C/GN/I, items 46-48, April, 29, 1970). Unfortunately it proved impossible to convene our working group between the second and the present third sessions, but I have used the time for getting into necessary contacts with the members of the working group on lunar nomenclature of the International Astronomical Union (IAU), for making acquaintance with the state of the problem and for looking for possible ways of its solution. The work undertaken resulted in the present review submitted for the consideration of the members of the working group and other experts interested in the problem.

Attached to the review are 5 papers:

1. Hamil Kenny. Place - Names on the Moon  
A Report. "Names", vol. 12, No. 12, No. 2. June 1964.
2. An extract from Transactions of the International Astronomical Union. Vol. XIB. Proceedings of the

eleventh General Assembly, Berkeley, 1961. London-New York, 1962, p. 237.

III. An extract from "Lunar Nomenclature". Report of the working group of the IAU Commission 17, The Moon, Proposed names of craters of the Moon's far side, with identifying biographical data. Presented at the 14th General Assembly of the IAU, Brighton, England, August 1970.

IV. C.Borkowski. Syntax and semantics of Lunese I. A Microlanguage for labeling Topographical Features of the Lunar Surface. Proceedings of the 10th International Congress of Onomastic Sciences. Vienna 1969, vol. II.

V. A.A.Gurstein, K.B.Shingareva. To the problem concerning the lunar crater designation system.

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1. Until recently the study of extraterrestrial topographic features (the term is meant to refer to the surface formations of the natural Earth satellite - the Moon and other planets of the solar system: the Mars, the Venus, etc.) has been the responsibility of the astronomers only. According to the established tradition astronomers themselves assigned names to the extraterrestrial entities discovered by them. It did not cause any difficulties until nominated features were relatively few in number. The insufficiency of the technical means of observation that the astronomers had at their disposal limited

the possibilities of studying and mapping the surface topographic features of extraterrestrial bodies.

2. At present the situation has sharply changed. The science and technique have made really fantastic progress in space studying. Not only the Moon but distant planets as well are now objects of thorough and detailed examination. The achievements in the Moon investigation are the most wonderful. Pictures of the Moon's surface, including its far side, taken by spacecrafts from close distance and immediate investigation of its surface by the man or automatically controlled apparatus (lunokhods) have enabled the scientists to open a new stage in their researches. Nowadays not only astronomers but also geodesists, geologists, geomorphologists, cartographers, surveyors and other specialists take part in studying and mapping the Moon.

3. The large - scale mapping, topographic at first and thematic later on, is a necessary pre-condition and an obligatory component of the modern lunar investigation. The maps at 1:5,000,000 and even 1:1,000,000 scale do not meet all the modern requirements any more. The task of compiling maps at the scales of 1:250,000, 1:25,000 and larger for selected regions of the lunar surface is being realized /15, 16, 17/.

The number of topographic features shown on the lunar charts now is continually increasing and the need

for names or other identifying designations for them is increasing as well. It should be reminded that it is rather difficult to make use of even small-scale lunar charts since many spots on them appear to be "dumb" (small-scale lunar charts show about 1,000 named features out of their total amount over 50,000).

4. The problem is as follows: is it possible, under the conditions of the existing astronomical practice of nomination of extraterrestrial entities, to overcome the difficulties in complication and utilization of lunar charts (and other planet charts as well) caused by the shortage of names of topographic features? Or, in other words, is it possible to increase till the necessary amount the number of extraterrestrial topographic features names basing on the astronomical practice only without taking into consideration the century-old experience in establishing millions of names for terrestrial (geographical) features?

In order to answer these questions it is necessary to have a good understanding of all the advantages and disadvantages of the IAU nomination system for extraterrestrial formations now in use.

5. The system of nomination of lunar surface formations applied at the present time goes to the middle of the XVII century. Astronomers Langrenus of Brussels, Hevelius of Danzig and Riccioli of Bologna are considered

the founders of lunar topography. They first gave names to more than 300 formations of the lunar surface on their maps published in 1645-1651. The main terminology for the lunar surface formations based on their outward resemblance to the forms of terrestrial relief - continents, seas, lakes, bays, marshes, mountain ranges, craters, etc.- appeared in that period and have been preserved up till now. Terrestrial place - names - the Alps, the Apennines, the Caucasus and others - have also been borrowed as specific elements of lunar mountain names. The lunar "seas" were given symbolic names connected, according to the medieval attitude, with the Moon's supposed influence on the Earth: Mare Crisium, Mare Tranquillitatis, Mare Imbrium, etc. As regards the most numerous group of lunar features - the craters - they were at first nominated for the outstanding astronomers and later on for other scientists from the antiquity till the present. Some place-names assigned at that time were later on replaced by others, but the system of assignment of certain categories of names to certain kinds of formations has been retained up to the present time. The system of designation of minor lunar features by Greek and Roman letters first applied by J.Schröter at the end of the XVII century has also been preserved. Besides, from the medieval epoch has been preserved the tradition to write the names of lunar features according to the Latin declination rules and spelling.

6. The development of astronomical study of the Moon and concomitant increase of cartographic and other publications entailed the increase of place-names and letter designations. But the authors of different publications often gave different names to <sup>the</sup> same features. Differences were settled only in 1932 when the International Astronomical Union accepted the responsibility for the normalization of the lunar nomenclature. A list containing 672 place-names had been drawn up by Commission 17 of the IAU and approved by the IAU Congress at Cambridge, USA, in 1932 /7/. To the next Congress held in 1935 the list almost did not increase (it numbered 680) but some 8 000 minor features attached to named features with a letter index system were added to it. The next two decades no essential progress was made in the Moon studying and, naturally, the list of lunar nomenclature grew very slowly: by 1951 it had amounted to 700. More detailed information on the point is given in Annex I.

7. The coming of the era of space research has completely changed the situation. Photographs of the Moon's far side first taken in 1959 by the Soviet automatic interplanetary station Zond 3 and after that by the American spacecrafts Orbiter IV and V gave publicity to a great many lunar formations. It became necessary to give them specific names and this was preliminarily done in the "Atlas of the Far Side of the Moon", 1960 /I/ and on the "Complete Lunar Chart" at the scale of 1:5,000,000, 1967 (I edition), 1969 (II edition) /6/. The maps of the Moon's far side pub-

lished in the same period in the USA used only numbers to identify new features /9/. The shortage of named topographic features on the lunar surface became especially noticeable on the maps of 1:1,000,000 scale published in the recent years in the USA /12/ and the USSR /3/.

8. The IAU Congress in 1961 in Berkeley, USA re-approved, with several corrections, the names and designations of the Moon's visible side features established and published in 1935. The Congress recommended to adopt the nomenclature of the Soviet "Atlas of the Far Side of the Moon", 1960 for the designation of the Moon's reverse side formations. Another resolution on the lunar nomenclature adopted by the Congress reads: "For designating the lunar surface features it is recommended that the previous rules be followed ...". These rules with several amendments were published in the transactions of the IAU, 1961 /20/ (see Annex II).

Thus, in spite of considerable progress made in the Moon studying the old classical system of lunar feature nomination has been preserved without change.

9. Following the rules of this system the working group on lunar nomenclature of Commission 17 of the IAU formed at the IAU Prague Congress in 1964 (Chairman Prof. Menzel, USA) made a great deal of preparatory work and drew up the list of "Proposed names of craters of the Moon's far side, with identifying biographical data" /14/



(See Annex III).

This list comprising 513 names on being consulted with the national Academies of Sciences and the members of the IAU Executive Committee was approved, with few corrections, by the 14th General Assembly of the IAU, Brighton, England, August, 1970. The final list of the lunar far side nomenclature is published in the "Sky and Telescope", 1970, № 5 (19). The Lunar Chart showing new names of the far side formations was published by NASA in November, 1970.

Such is the present state of the problem of lunar topographic nomenclature.

10. The papers of Prof. Menzel's working group and the resolutions of the XIV General Assembly of the IAU demonstrate that a great deal of useful work has been done that contributed to the normalization of the lunar nomenclature. However some recommendations seem disputable. Thus, e.g. the name of the prominent English scientist Rutherford was declined for the reason that there is a Rutherford on the visible side, Born was declined for fear of confusing him with Bohr. We think that such dread of closely sounding names is rather excessive. We also believe that the "surgical operation" performed for the crater names given after Joliot-Curie and Sklodovska-Curie cannot be justified. An arbitrary name replacement from some features to others is extremely bewildering as well.

11. The above stated comments deal with particular cases and it is not difficult to eliminate the ground for them. It is of greater importance to stress that the "classical" system rules of nomination of lunar formations still applied by the IAU are not efficient enough in case of careful scanning and large-scale mapping of the Moon's surface. Therefore it cannot be denied that the criticism directed against it today is quite justified. C. Borkowski of Pennsylvania University writes: "Face to face with a lunar "information explosion", classical lunar nomenclature is proving to be outmoded, slow, and controversial. Since it is now necessary to provide promptly data about lunar surface to all scientific, technical, and administrative groups concerned with the many aspects of lunar studies, it is essential to establish efficient methods of collecting, organizing, storing and distributing lunar information. However, at present, processing of lunar data is affected adversely by the structure of the existing lunar naming system". /8/ pp. 397-398.

These words answer the first question put at the beginning of this review (item 4).

12. Now we shall try to answer the other one: is it possible to make use of the experience in the nomination of terrestrial geographical features when treating the problems of extraterrestrial nomenclature and, if so, how to do it? A direct transfer of this experience is absolutely excluded in this case for the circumstances under

which names of lunar and terrestrial topographic features are formed are too different. Many components natural for <sup>terrestrial</sup> the landscape influence the creation of place-names and form part of them. They are: areas where people, animals or plants inhabit, water bodies, meteorological phenomena, soil and ground conditions, geological structure, relief forms, etc. As far as the Moon is concerned only the last three components can be used for lunar place-names creation. They can, but have not been used yet. For this reason and for absence of alternative proposal the IAU traditional system of exonyms and commemorative names should be preserved for major features of the lunar surface.

13. As regards the designation system for minor topographic features of the lunar surface, it requires special elaboration. The experience in nominating features in such geographic regions as the Antarcitics can be useful. Some attempts to develop a new system of nomination of minor topographic features of the lunar surface have been undertaken lately. Two of them may be cited here as examples. It is of certain interest the artificial language invented by C. Borkowski - Lunese I in which lunar place-names would contain the information on the location of features /8/ (See Annex IV). A system of figure indices instead of names might prove to be more efficient for minor topographical features of the Moon's surface. A variant of such a system proposed by A.A. Gurstein and K.B. Shingareva has been submitted to the IAU for acquaintance (See Annex V). We believe

that not only astronomers but also geodesists, cartographers, geographers and linguists, i.e. the specialists of various countries of the world represented in our Ad Hoc Group of Experts should take part in the discussion and perhaps in the elaboration of such proposals.

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Some general conclusions that can be drawn from these statements are as follows:

a) The problem of nomination of extraterrestrial topographic features, in the first place of minor features of the lunar surface are growing more urgent every year.

b) The nomenclature of major formations of the lunar surface established by the IAU may be preserved as traditional. As for generic terms and system of specific names or other identifying designations for minor topographic formations of the Moon, further investigation should be performed by joint efforts of specialists in different sciences (astronomers, geographers, geomorphologist, cartographers and others).

c) It would be advantageous to submit both the results of these investigations and systems of designation of the Moon's minor topographical features (as well as of other celestial bodies) recommended for international use

to joint meetings of the Ad Hoc Group of Experts on geographic names and the IAU Commission 17 for discussion and approval of appropriate recommendations.

d) It would be advisable that our working group prepare a survey of the present state of the problem of nominating extraterrestrial topographic features (the Moon may be chosen as example) and of adequate ways for its solution so that we could discuss it and adopt appropriate recommendations at the second UN Conference on the standardization of geographic names in 1972.

e) In order to avoid contradictions and overlapping in the solution of the problem it is necessary to get into contact with the IAU Executive Committee and to organize the mutual exchange of necessary information.

#### REFERENCES

1. Атлас обратной стороны Луны. Изд-во АН СССР, М., 1960
2. Атлас обратной стороны Луны, ч. II, "Наука", 1967.
3. Карта Луны, экваториальная зона видимого полушария, м-б 1:1,000,000, "Наука", М., 1968.
4. Дж. Кайпер, Сб.: Фигура Луны и проблемы лунной топографии, "Наука", 1968.
5. Липский Ю.П., Шевченко В.В. Основы физического картирования лунной поверхности, "Астрономический журнал", 1970, № 3.

6. Полная карта Луны, м-б 1:5,000,000, М., 1967 ( I издание), 1969 (II издание).
7. M.A.Blagg, K.Müller. Named Lunar Formations. London, 1935.
8. C.Borkowski. Syntax and semantics of Lunese I. A Micro-language for labeling Topographical Features of the Lunar Surface. Proceedings of the 10th International Congress of Onomastic Sciences. Vienna, 1969, vol.II.
9. Cross(A. A guide to the Moon's far side. "Spaceflight", 1970, No.2.
10. Hamil Kenny. Place-Names on the Moon: A Report, "Names", vol. 12, No.2, June 1964.
11. Harbour Terry. Geologic mapping of the Moon. "Allgem. Vermessungs - Nachr.", 1969 , № 5.
12. Lunar Astronautical Chart, 1:1,000,000, NASA-ACIC, 1960-1967.
13. Lunar Chart, 1:10,000,000, NASA-ACIC, 1970
14. Lunar Nomenclature, Report of the working group of the IAU Commission 17, The Moon. Proposed names of craters of the Moon's far side with identifying biographical data. Presented at the 14th General Assembly of the IAU, Brighton, England, August 1970.
15. Meine K.H. Kartographischen Aspekte im Raumflugprogramm der USA und der UdSSR. "Allg. Vermess.- Nachr.", 1970, No.5.
16. Schlager Charles W. Interpretation of lunar photography. "Bildmess. und Luftbildwes.", 1970, No.1.

17. Schlager Charles W., Penney Robert A., Higgins Jerry R.  
Extraterrestrial mapping and charting. "Surveying and  
Mapping", 1968, No.4.
18. Some recent lunar atlases and maps. "Sky and Telescope",  
1968, No.3.
19. Names on the Back of the Moon, "Sky and Telescope",  
1970, No.5.
20. Transactions of the International Astronomical Union,  
vol. XIB, Proceedings, 1961, London- New York, 1962.