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CONTEMPORARY PROBLEMS OF SELENONYMY */

Paper submitted by the Government of the
United States of America

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CONTEMPORARY PROBLEMS OF SELENONYMY

(LUNAR NOMENCLATURE)

by

O. Waddell and C. Barsky

In recent years an urgency has arisen for the naming of lunar features. American and Soviet space probes have brought the moon into our "backyard" to be examined and analyzed, and to have its selenographic formations identified by specific or specific and generic nomenclature.

At the present time, there are approximately 5,000 named features on the moon. This figure includes the unimaginative expedient of identifying lesser features in an area by adding letters to the name of the predominant physiographic unit. Thus, the smaller craters in the area of Sabine become Sabine A, Sabine B, and Sabine C, and so on (see attached Ranger VIII Lunar Map).

A glance at the history of naming lunar features illustrates the need for a uniform, internationally acceptable and self-sufficient system of deriving names for lunar features.

As early as the 17th century map makers such as Jan Hevelius (1647) used the names of terrestrial continents, seas, and mountains on lunar maps to identify the larger plains,

craters, ridges, mountains, and other features. Thus, such names as Alps, Apennines, and Carpathians still survive on our moon maps today. Some map makers (e.g. van Langren, 1645) experimented with the naming of lunar features after deceased astronomers, scientists, and other prominent personnages. This proved to be more popular than the application of terrestrial names. As more powerful telescopes were built, astronomers were able to observe many additional configurations on the face of the moon and mappers soon depleted their reserve of deceased notables, turning to the use of names of living persons, often including their own. Finally, they had to resort to the previously described procedure of adding letters to the names.

A major step toward international acceptance of lunar feature names was taken in 1935 when the International Astronomical Union (IAU) approved the names listing prepared by M. Blagg and K. Muller. This listing, published under the title, Named Lunar Formations, with subsequent revisions by the IAU, has become a primary source for neoselenonymy (recent lunar nomenclature)

Since the first space vehicle eyed and photographed our satellite at close range, the problems of selenonymy have been compounded. So many additional features on the moon have become visible and require identification that neither the IAU

listing nor any other presently used procedure for naming lunar features will serve to satisfy the appetites of the map maker or the selenographer. Soon names and letter designations will be exhausted. The IAU meetings are held only periodically and, consequently, the assignment and approval of lunar nomenclature has proved to be too slow to keep pace with the mapping effort. Also, as the various countries of the earth become the first to photograph certain regions of the lunar surface in detail, they tend to name the features, and naturally so, in accord with considerations of national character, interest, and policy. This often results in outcries of nonacceptance from other nations.

In order to resolve these problems, a new system is required for the instant assignment of lunar names. This system must in no way interfere with the historico-classical selenonymy that is already in use, nor must it hinder any future decisions by the IAU. It must, further, lend itself to unerring international communication and, at the same time, be easily adaptable to automatic data processing which has become an inherent part of the space age.

The system we propose will satisfy the aforementioned conditions and allow for the automatic naming of even very small lunar features (e.g., craters less than 100 feet in radius). This system eliminates duplication, expresses no

national connotations, is limitless in scope, and should preclude th necessity of obtaining international agreement on each individual reference. The new system would relieve those who are hard pressed in their search for new selenonymic identifications, and will eliminate the time, effort, and expense presently alloted for this activity.

The new system is based on the adoption of an internationally accepted system of lunar coordinates (Selenographic Coordinate System which appears on the attached Ranger VIII Lunar Map) and the conversion of the coordinates in this system into phonetic units that will be used to construct lunar feature names.

Because in the Selenographic Coordinate System there is no east or west and the meridian identifications cover the gamut of the circle (from 0^{o} to 360^{o}) the conversion of the coordinates into phonetic units will reflect the longitude first. The Selenographic latitude notation, which is more conventional (0^{o} to 90^{o} north and 0^{o} to 90^{o} south) follows. Thus, arranging the coordinates of Sabine B (on the Ranger VIII Lunar Map) to the nearest tenth of a minute, for conversion into phonetic units, the reading would be 22^{o} 05.5' N 01^{o} 19.0'.

For purposes of naming, two six-digit units would be constructed. In the case of Sabine B. A zero would be added in front of the longitude reading, which will constitute the

first unit, making it 022055, the three leftmost numbers representing degrees, the next two, minutes, and the sixth one, tenths of a minute. The latitude reading will constitute the second unit. Again for Sabine B, it would stand as N01190, the first digit (letter) indicating the hemisphere, the next two, the degrees, the fourth and fifth, minutes, and the last one, tenths of a minute.

In order to convert the numerical designations to phonetics the following table of equivalents has been developed:

0 1 2 3 4 5 6 7 8 9

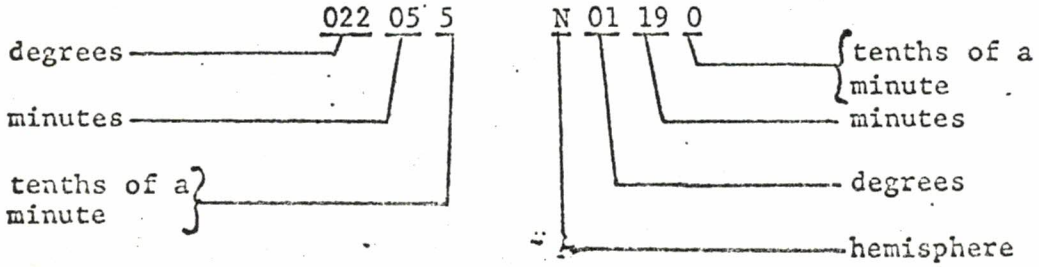
B C D F G H J K L M first alphabet

N P Q R S T V W X Z second alphabet

The first alphabet will be used for converting numbers to phonetic equivalents, except in cases where two or more like numbers follow one another in the longitude or latitude readings, in which case the letter equivalents whould be alternated between the two alphabets for each succeeding like number. (For example, a reading of 333° 33.3' would phoneticize as FRFRFR.)

The vowels A, E, I. O, U, and the semi-vowel Y are assigned no numerical values and are to be used to render the consonant combinations pronounceable.

The full reading for Sabine B, therefore, is



A conversion to phonetics would result in

0 2 2 0 5 5 N 0 1 1 9 0

B D Q B H T N B C P M B

Note that the designations N and S indicating the hemispheres retain their phonetic values.

The insertion of vowels into the BDQBHT NBCPMB combination evolved for Sabine B would result in some reasonably pronounceable sequence such as

BADQUIBHAT - NOBCAMPMOB

We recognize, of course, that at first sight such a derivation might seem lengthy and "unterrestrial", yet habituation will overcome such preliminary objections as it ever has in the course of man's progress.

Since the selection of vowels is to be related to the phonemics of a language, their sequence and position may not be predetermined. Nevertheless, the choice and succession of vowels within a particular selenonym should be made subject to the approval of a competent body that concerns itself with toponymics, such as the United States Board of Geographic Names. Such a practice would standardize the spelling of lunar names for use within a given language.

Our proposal is not intended to replace the present naming procedure but rather to supplement it. As more "desirable" names become available and are acted upon they may be entered into the selenonymic repertory. Just as it has been man's age-old prerogative to rename features on Earth, so shall it remain on the Moon.

If this system had been in use a combination such as FEDABCUB - NONFEDHALBY might have been renamed GRUITHUISEN, which indeed is the name borne by the feature today, and DIMFEDHAB - SOCJIGHUB should have become CRÜGER.

The advantages of this system far outweigh its phonic drawbacks.

1. A computer or a human can automatically derive a name for a feature from its selenographic co-ordinates. Of course, the reverse is true, as well. Given the name, the human or electronic element can locate the feature.
2. All lunar features may be named without duplication or exhaustion of possibilities.
3. There will be international uniformity in the derivation of selenonyms and, even though the selection of vowels may differ, there would be no effect upon any conversion back to coordinates, since vowels have no numerical values.
4. Referencing lunar features in directives, articles, and project reports would be considerably simplified since the name itself would be the key to its location. If additional identification is required regarding the type of feature, it would be an elementary matter to assign numerical values to the generics by the same alpha-numerical code using the first two consonants of the generic.

RANGER VIII LUNAR MAP

SABINE B