

This group of representatives of the Scientific Unions of ICSU involved in lunar studies operate on three ways: an advisory panel – a coordinating body – a channel through the Scientific Unions.

The Unions and members are the following:

IAU (Astronomy): A. Dollfus (Chairman) – E. Anders.

IUGG (Geophysics): S. K. Runcorn, G. D. Garland (Alternate).

IUGS (Geology): W. Von Engelhardt – S. Van der Heide (Alternate).

URSI (Radio-Science): M. P. Misme – T. Hagfors and V. S. Troitsky (Alternates).

COSPAR (Space Research): H. Mazursky – K. P. Florensky (Alternate).

The parent Union is the International Astronomical Union. The Chairman is A. Dollfus (Observatoire de Paris, 92 Meudon, France). The Secretary is J. E. Guest (University of London Observatory, 33/35 Dawns Lane, London NW7 4SD, England).

The Constitution meeting was held in Paris on 24 May 1971. The first formal session was held in Paris on 15 November 1971. An informal session was organized in Houston (Texas) on 12 January 1972. A general assembly met on 28–29 Nov. 1972.

One of the first actions of IUCM-CIUL was to react officially at the NASA's announcement concerning a possible cancellation of the two last already scheduled manned missions to the Moon – Apollos 16 and 17. The Chairman of IUCM-CIUL transmitted to President Nixon, through IAU's General Secretary, the statements and resolutions adopted by IAU during the past years to emphasize the importance of lunar exploration for the development of science in the present conjuncture.

The following items have been given active consideration by IUCM-CIUL:

Lunar nomenclature: The need for a proper nomenclature to lunar features of smaller scale than those already designated in the IAU system (worked out for the earth-based telescopic observations), was reviewed through the different disciplines represented within IUCM-CIUL. It was agreed that the responsibility for this task should continue to be the existing IAU Working Group, and the extension of its responsibility to the smaller features was fostered by the appointment of Dr Mazursky to this group. IUCM elaborated also the contacts with the United-Nations Working Group "Names of Extraterrestrial topographic features" under the chairmanship of Dr Komkov.

Lunar coordinates: The Inter-Union was asked to consider the problem of a unified lunar coordinates system. Reports and discussions on earth-based, spacecraft and other results concluded that, at the present time, it is premature to accept a system of coordinates derived by one method. A final system should be based on the Moon's center of mass and the principal axis of inertia. A list of about 200 craters to be used as reference locations for measurements should be agreed between workers from different groups. This list should include sufficient craters within the areas covered by Apollo metric photography to satisfy those workers involved in photogrammetric analysis. The sub-group of the IAU-Working Group "Figure, mouvements et positions observées de la Lune" is working along this line.

Panel of Scientific Priorities: IUCM-CIUL act as an advisory group emanating from the different disciplines involved in lunar science to localize the lunar studies in the scientific priorities requested by the Panel of ICSU.

WORKING GROUP ON LUNAR NOMENCLATURE

Members: D. H. Menzel (Chairman), B. Levin, A. Dollfus, H. Mazursky.

The task assigned to the former Working Group (1967–70) was the designation of the major craters of the farside of the Moon. After completion of this work and its official endorsements at the last 1970 IAU General Assembly, the task of the Group was re-directed towards the nomenclature problem of the smallest features of the lunar surface.

Apparently the current system of nomenclature worked out at the time of lunar telescopic observations and improved in successive steps by IAU fitted well the needs for the lunar studies at the groundbased telescopic scale. But clearly the new needs of the space exploration reaching resolving power of the order of 100 times smaller than the best telescopic observations (10^4 more pixels), and a fortiori of the direct exploration needing mineralogic sizes scale, requires more than a crude

extension of the existing system. The new NASA mapping program at a scale 1:250000 opens the problem in practical terms.

Due to the great activity of W.G. developed with the cooperative advices of the Inter Union IUCM-CIUL, the problem is moving fast in the period of writing the present report (Jan. 73). Accordingly, the following adaptation of an Interim Report (Dec. 11, 1972) by the Chairman D. H. Menzel has the character of a progress report:

“The current system of lunar nomenclature, nearside only, was developed by Mädler between 1830 and 1837. He established the system of naming the larger craters and assigning capital Latin letters to surrounding, smaller, ‘satellite’ craters. Many maps have been prepared and published since Mädler’s day, with increasing detail. Between 1921 and 1935, Blagg and Müller, under auspices of the IAU, prepared an extensive review of the existing maps. At the same time, they arbitrarily assigned letters to many small craters, leaving numerous craters of intermediate size undesignated. The Lunar and Planetary Laboratory of the University of Arizona, during the past fifteen years or so, has continued with an excellent and critical study of the problem. These studies led to the production of an *Atlas and Gazetteer of the Near-Side of the Moon*, published in 1971 under the authority of the National Aeronautics and Space Administration, as NASA SP-241. This excellent volume, based on photographs taken with lunar Orbiters rather than on ground-based photographs or hand-drawn maps, contains the best summary, to date, of lunar nomenclature for the near side of the Moon.

“Of the 6050 designated features on the Moon’s near side, approximately 700 are listed as primary objects and the remaining as satellites. Capital Roman letters were used for craters, valleys, and other depressions; lower case Greek letters were used for hills, mountains, and other ‘eminences’. This traditional system is cumbersome, and almost impossible to extend to smaller features.

“There is an urgent need for new decisions. NASA is currently planning to start a new series of lunar maps, which are likely to be standard for a long time to come. These maps, drawn on a scale of 1:250000 will require about 200 in all. The first objective, which will start in March 1973, will be the production of approximately 50 such maps, covering primarily the equatorial zones extensively photographed by the lunar Apollo missions. A sizeable number of these large-scale maps will not contain a single named feature, particularly for the far side. And, for the near side, a large number will have as its primary feature only one of the lettered craters, such as Picard Y, and so on.

“NASA advises that they would like to name each sheet for a principal named feature. They feel that duplication of features, such as having one chart named Picard, say, and another Picard Y could be extremely confusing. Accordingly, NASA has officially requested our Working Group to proceed with the revision we have proposed for craters on the near side, and continue with supplying additional names for the far side. NASA has indicated its approval and support of IAU authority in this matter.

“Accordingly the Chairman is proceeding along lines followed for the preliminary naming of the far side, contacting international groups for suggestions of names, with emphasis on persons other than physical scientists, who have dominated in prior selections.

“Our list will include, however, a few distinguished scientists, primarily astronomers, who have died since the last general assembly. It will also include a number of physical scientists whose names were omitted earlier because of the similarity in sound to others already approved. Thus Born had not been included because of its similarity to Bohr; Rutherford because of its similarity to Rutherford; Lawrence because of its similarity to Lorentz. We have since determined that these ‘sound-alikes’ are not unacceptable.

“The Working Group, with the help of a sub-committee of the cartographers, also considered the problem of nomenclature of smaller features, perhaps down to diameters of less than 100 meters. It was suggested that ‘given names’, such as John, Mary, Edward, Nikolai, Courtney, and the like, would provide satisfactory names. The features themselves will generally be too small for identification on anything other than photographs showing the area, perhaps with photographs of intermediate scale to bridge the gap between the small-scale photographs and existing maps. The sugges-

tion proposed by some that the latitude and longitude of an object, large or small, be translated into a literal code, is not satisfactory at least at the present time. We do not have the system of lunar coordinates adequately defined to make such alpha-numeric systems practical.

"There is one final point to emphasize concerning our selection of names. We shall continue to exclude all political figures, national heroes, religious figures, and modern philosophers. Ancient philosophers and various legendary figures will be accepted, however."

The subsequent phases of the work following this interim-report will be presented at the general Assembly, Sydney, Aug. 1973.

GRUPE DE TRAVAIL "FIGURES, MOUVEMENTS ET POSITIONS OBSERVÉES DE LA LUNE"

Th. Weimer (Chairman), 16 members and 9 consultants.

Several lists of bibliographic references on current publications and reports on the figure of the Moon cartography and selenodesy were circulated for the Members.

A sub-group was appointed to study a list of selected craters for geodetic purposes, and the problem of a unified lunar coordinate system. The members are: Weimer, Moutsoulas, Gavrilov.

Th. Weimer, Chairman of the W.G., reports:

"Entre septembre 1970 et octobre 1972, le bulletin bibliographique du groupe a analysé 160 articles ou mémoires; 57 concernaient la cartographie et la sélénodésie, 15 la rotation de la Lune, 88 son orbite et son potentiel gravitationnel.

"La télémétrie par laser sur laquelle on fonde de grands espoirs n'est qu'à son début et ne pourra de sitôt remplacer complètement les méthodes photographiques classiques utilisées en sélénodésie et en cartographie.

"Le Groupe de Travail a participé à l'organisation de certaines recherches:

"(1°) en émettant à l'Assemblée Générale de 1970 un voeu pour le dépôt d'un plus grand nombre de cataphotes sur la Lune.

"(2°) en élaborant une liste de cratères qui servira de base à un catalogue de coordonnées de points fondamentaux sur la Lune, catalogue indispensable pour la sélénodésie et la cartographie de haute précision. Les voies et manières nécessaires pour transformer cette liste en catalogue de cratères fondamentaux feront l'objet de travaux du groupe dans les mois à venir, afin que des propositions concrètes puissent être présentées à l'Assemblée Générale de Sydney (1973)."

About the occultation observations program, J. D. Mulholland reports:

"A program of high-speed photoelectric occultation timings is being pursued at the McDonald Observatory. These measures provide the occultation event time with a resolution of 1 millisecond, corresponding to a linear distance of about 1 meter at lunar distance. In addition, one obtains a value for the slope of the lunar limb at that point. The limb slope measures do correlate with the known limb profiles. We are preparing to discuss these occultation observations and those of grazing occultations in combination with the laser ranges. This will provide rather high resolution in all three coordinates, although the uncertainties in the limb profile must be recognized as a limiting factor. Nonetheless, the development of an extremely high-precision numerical ephemeris seems to be very near."

Mrs. F. M. Sadler, from H.M. Nautical Almanac Office, Royal Greenwich Observatory, summarizes as follows:

"At present about 9000 observations of lunar occultations are being received annually; this high number is due in part to several passages of the Pleiades. The observations are reduced on receipt and the results sent to the observers. The analysis of 40000 occultations for the period 1943-1972 has been completed and the resulting corrections to the mean lunar elements (due to Brown) will be published shortly. One important result, found from the analysis, is that the tidal deceleration of the Moon in mean longitude is $-21'' (\pm 2'') T^2$ where T is in centuries. Analysis of grazing occultations shows that the position angles of C. B. Watts' charts of the marginal zone requires a correction of $-0^{\circ}25 (\pm 0^{\circ}01)$ (03-094.254).