XIIIth General Assembly

Prague
Czechoslovakia

1967

XIIIe Assemblée Générale

Prague
Tchécoslovaquie

1967

RESOLUTIONS ADOPTED

BY THE GENERAL ASSEMBLY

SUMMARY OF DECISIONS CONTAINED IN THE REPORT OF THE GENERAL ASSEMBLY

1. *Unit of Contribution.* The amount of the unit of contribution has been fixed, for 1968, 1969, 1970, at a value of 900 gold francs, according to item 11(*b*) of the Statutes.

2. *Commissions.* The following decision has been taken

To re-name Commission 43 "Astrophysical Plasmas and Magneto-Hydrodynamics".

3. *Resolutions submitted within the statutory delays by National Committees of Astronomy.* Three such resolutions are summarized under item 9 of the Agenda of the General Assembly. Resolution A1, submitted by the German Democratic Republic, proposed the creation of a new Commission on Relativistic Astrophysics and Cosmology. After discussion in Commissions 28 and 40, the National Committee of the German Democratic Republic decided to withdraw, completely and simply, this resolution designated as A1. Two resolutions, A2 and A3, proposed by the National Committee for Astronomy of Belgium, were submitted for advice to Commissions 5 and 19 respectively. Upon recommendation of the Commissions in question, the General Assembly adopted these resolutions, either unchanged, as in the case of resolution A2 (but with a comment in the report of the meetings of Commission 5), or slightly changed, without, however, affecting the scientific content, as in the case of resolution A3.

4. *Resolutions proposed by Commissions.* A certain number of Commissions proposed, before the General Assembly (point 10 of the Agenda), or in the course of their meetings held during the General Assembly, resolutions of a financial character or of general nature. The financial resolutions were included into the budget in so far as the project proposed was considered possible. The reasons for reducing the amounts proposed by Commissions (or for suppressing certain specific projects of Commissions) are given in the finance report (hereabove, page 22). Accepting the budget proposed by the Finance Committee and the report of this Committee, the General Assembly expressed its opinion as to these resolutions.

Moreover, the Resolutions Committee considered certain resolutions of a sufficiently general character to be dealt with by the General Assembly. These resolutions are included in resolutions 1 through 8, as hereinafter.

One resolution, proposed by Commission 37, concerned the over-all organization of the activities of the Union. This proposal has been deferred to the consideration of the new Executive Committee.

Finally, all the other resolutions adopted by Commissions are globally supported by resolution no. 9, as hereinafter. These resolutions have not been reproduced separately and are included in the reports of Commissions

RESOLUTIONS ADOPTEES

PAR L'ASSEMBLEE GENERALE

SOMMAIRE DES DÉCISIONS CONTENUES DANS LE RAPPORT DE L'ASSEMBLÉE GÉNÉRALE

1. *Part Contributive Unitaire.* La part contributive unitaire a été fixée pour 1968, 1969, 1970, à 900 francs-or, conformément à l'article 11(*b*) des Statuts.

2. *Commissions.* La décision suivante a été prise

La Commission 43 prend le nom de: "Plasmas et Magnéto-Hydrodynamique en Astrophysique".

3. *Résolutions proposées dans les délais statutaires par les Comités Nationaux d'Astronomie.* Trois telles résolutions figurent au point 9 de l'Ordre du Jour de l'Assemblée Générale sous une forme résumée. La résolution A 1, proposée par la République Démocratique Allemande, concernait la création d'une nouvelle Commission sur l'Astrophysique Relativiste et la Cosmologie. Après discussion par les Commissions 28 et 40, le Comité National de la République Démocratique Allemande a décidé le retrait pur et simple de cette résolution, désignée par A 1. Deux résolutions, A 2 et A 3, proposées par le Comité National d'Astronomie de Belgique ont été soumises pour avis aux Commissions 5 et 19, respectivement. Elles ont été adoptées par l'Assemblée Générale après avis de ces Commissions, sous une forme non modifiée en ce qui concerne la résolution A 2 (la Commission 5 incluant dans les comptes rendus de ses réunions des commentaires à cette résolution), et sous une forme modifiée (mais n'altérant pas le contenu scientifique de la résolution) en ce qui concerne la résolution A 3.

4. *Résolutions proposées par les Commissions.* Un certain nombre de Commissions ont présenté avant l'Assemblée Générale (point 10 de l'Ordre du Jour), ou ont voté, au cours de leurs réunions tenues pendant l'Assemblée Générale, des résolutions de caractère financier ou d'ordre général. Les résolutions financières ont été incluses dans le budget lorsqu'il a été jugé possible d'assurer ce financement. Les raisons des réductions apportées à ces demandes des Commissions (ou des suppressions de certaines entreprises spécifiques des Commissions) sont exprimées dans le rapport financier (ci-dessus, page 22). En acceptant le budget proposé par le Comité des Finances, et l'ensemble du rapport du Comité des Finances, l'Assemblée Générale a exprimé son opinion sur l'ensemble de ces résolutions.

De plus, le Comité des Résolutions a jugé certaines résolutions d'ordre assez général pour être considérées par l'Assemblée Générale. Elles sont incluses dans les résolutions 1 à 8 données ci-après.

Une résolution issue de la Commission 37 concernait l'organisation générale des travaux de l'Union. Elle a été déférée, pour étude, au nouveau Comité Exécutif.

Enfin les autres résolutions votées par les Commissions ont été appuyées globalement par la résolution no. 9 ci-après. Ces résolutions n'ont pas été reproduites séparément et se trouvent dans les rapports des Commissions.

Resolution No. A 2
Proposed by the Belgium National Committee for Astronomy
Proposée par le Comité National Belge d'Astronomie

On the publication of bibliographical cards

The International Astronomical Union proposes that the producers of astronomical publications examine the possibility of including cards of standard format giving, for each article, a very short summary of the subject matter in addition to the bibliographical reference.

Sur l'édition de fiches bibliographiques

L'Union Astronomique Internationale propose que soit examinée la possibilitée, pour les éditeurs des publications astronomiques, de joindre à celles-ci des fiches de format normalisé donnant pour chaque article, en plus de la référence bibliographique, un très court résumé du sujet traité.

Resolution No. A 3
Proposed by the Belgium National Committee for Astronomy
Proposée par le Comité National Belge d'Astronomie

On Earth tides

Taking note of certain results obtained in the field of Earth tides, the International Astronomical Union recommends that studies of short-period terms of nutation be undertaken and followed up.

Sur les marées terrestres

Etant donné certains résultats obtenus dans le domaine des marées terrestres, l'Union Astronomique Internationale recommande que les études des nutations à courte période soient poursuivies et développées.

Resolution No. 1
Proposed by the Executive Committee
Proposée par le Comité Exécutif

On the metric system

The International Astronomical Union recommends the general use by astronomers all the world over, and in all their publications, of units of the metric system, either exclusively, or together with units of other systems, both values being then given for each quantity.

Sur le système métrique

L'Union Astronomique Internationale recommande l'utilisation générale par les astronomes du monde entier, dans toutes leurs publications, des unités des systèmes métriques, soit exclusivement, soit concurremment à l'usage d'unités d'autres systèmes, les deux valeurs étant alors données pour chaque grandeur.

Resolution No. 2
Proposed by the Executive Committee
Proposée par le Comité Exécutif

On satellite-borne reflector systems

The International Astronomical Union has noted with serious concern the beginning of studies of satellite-borne reflector systems. It notes with relief the assurance given by the competent authority that the Government of the United States of America is not interested in the concept of orbiting reflector systems at the present time and that no activity in such a direction is visualized.

Sur les satellites porteurs de systèmes réflecteurs

L'Union Astronomique Internationale a noté avec une sérieuse inquiétude que des études sur les systèmes réflecteurs portés par des satellites étaient entreprises. L'Union note avec soulagement l'assurance donnée par les autorités compétentes que le Gouvernement des Etats-Unis d'Amérique n'est pas intéressé actuellement à la conception de systèmes réflecteurs orbitants et qu'aucune activité n'est envisagée dans cette direction.

Resolution No. 3
Proposed by Commission 41 (History of Astronomy)
Proposée par la Commission 41 (Histoire de l'Astronomie)

On instruments and documents of historical interest

The International Astronomical Union reminds all astronomers of the request to save from damage or destruction astronomical instruments of historical interest; these are considered to be important documents in the history of science. Where it is not possible to preserve such instruments *in situ*, directors of observatories and others are requested to do everything possible to ensure that they are preserved in museums.

It laments the fact that the personal papers of some astronomers have been destroyed by those unacquainted with their value, and therefore urges individuals and observatories to protect and preserve such manuscripts and letters.

Sur les instruments et documents d'intérêt historique

L'Union Astronomique Internationale rappelle à tous les astronomes sa demande de protéger de tout dommage ou destruction les instruments astronomiques d'intérêt historique; ces instruments sont en effet des documents importants pour l'histoire des sciences. Quand il est impossible de protéger sur place ces instruments, les directeurs d'observatoires et autres autorités responsables sont priés de faire leur possible pour que les instruments soient conservés dans des musées.

L'Union regrette le fait que les papiers personnels de quelques astronomes aient été détruits par des personnes ignorant leur valeur, et de ce fait invite instamment les particuliers et les observatoires à protéger et conserver de tels manuscrits et lettres.

Resolution No. 4
Proposed by Commission 41 (History of Astronomy
Proposée par la Commission 41 (Histoire de l'Astronomie)

On the preparation of an international history of astronomy

The International Astronomical Union recognizes the importance and usefulness of preparing an international history of astronomy based on original materials, supports the initiative in this endeavour of Commission 41 on the History of Astronomy and requests the assistance of National Committees for the History of Astronomy and of specialists in the history of science, as well as astronomers, in carrying out this task.

Sur la préparation d'une histoire internationale de l'astronomie

L'Union Astronomique Internationale reconnaît qu'il est important et utile de préparer une histoire internationale de l'astronomie à partir de documents originaux, soutient dans ce domaine l'initiative de la Commission 41 sur l'Histoire de l'Astronomie et sollicite l'aide des Comités Nationaux d'Histoire de l'Astronomie et des spécialistes d'histoire des sciences, ainsi que des astronomes, pour mener cette tâche à bien.

Resolution No. 5
Proposed by Commissions 4 (Ephemerides) and 31 (Time)
Proposée par les Commissions 4 (Ephémérides) et 31 (L'Heure)

On the definition of the second

(*a*) The International Astronomical Union notes with satisfaction that the Consultative Committee for the Definition of the Second adopted on 13 July 1967 the Recommendation no. S-1 for the definition of the second which is to be the basic unit in the International System of Units, and that the definition S-1 recognizes the existence also of the second of ephemeris time. The International Astronomical Union concurs with this proposed definition S-1 of the second.

(*b*) It is understood that the General Conference of Weights and Measures may adopt a definition slightly different from that in Recommendation S-1. In this case the International Astronomical Union requests that, in the portion which states that the ephemeris second is not part of the International System of Units, there be included the phrase "the ephemeris second, which is part of the IAU System of Astronomical Constants".

Sur la définition de la seconde

(*a*) L'Union Astronomique Internationale note avec satisfaction que le Comité Consultatif pour la Définition de la Seconde a adopté le 13 juillet 1967 la Recommandation no. S-1 sur la définition de la seconde qui doit devenir l'unité de base du Système International des Unités et que la définition S-1 reconnaît ainsi l'existence de la seconde de temps des éphémérides. L'Union Astronomique Internationale exprime son accord avec cette définition proposée (S-1) de la seconde.

(*b*) Il est entendu que la Conférence Générale des Poids et Mesures peut adopter une définition légèrement différente de celle de la Recommandation S-1. En ce cas, l'Union Astronomique Internationale demande que, dans la portion du texte adopté qui précisera que la seconde de temps des éphémérides ne fait pas partie du Système International des Unités, soit incluse la phrase "la seconde de temps des éphémérides, qui est partie intégrante du Système des Constantes Astronomiques de l'Union Astronomique Internationale".

Resolution No. 6
Proposed by Commissions 4 (Ephemerides) and 31 (Time)
Proposée par les Commissions 4 (Ephémérides) et 31 (L'Heure)

On the use of natural observational phenomena in determining the Ephemeris Time and the Universal Time

The International Astronomical Union wishes to emphasize that, notwithstanding

(*a*) the proposal before the General Conference of Weights and Measures to adopt the definition of the second as a basic unit in the International System of Units, in terms of an atomic transition, and

(*b*) the consequential possibility of setting up an integrated scale of Atomic Clock Time obtained by the continuous addition of multiples of this unit,

measures of time for the purpose of astronomy and associated sciences must continue to be based on natural observational phenomena such as give rise to Ephemeris Time (based on the orbital motions of bodies in the solar system) and Universal Time (based on the rotation of the Earth).

Sur l'utilisation de phénomènes observationnels naturels dans la détermination du Temps des Ephémérides et du Temps Universel

L'Union Astronomique Internationale désire insister sur le fait que, nonobstant

(*a*) la proposition faite à la Conférence Générale des Poids et Mesures d'adopter une définition de la seconde comme unité de base dans le Système International des Unités, qui soit établie à partir d'une transition atomique, et

(*b*) la possibilité, par voie de conséquence, de l'établissement d'une échelle intégrée de Temps Atomique obtenue par l'addition continue de multiples de cette unité,

les mesures de temps nécessaires à l'astronomie et aux sciences associées doivent continuer à être poursuivies à partir de phénomènes observationnels naturels, tels que ceux qui permettent la définition du Temps des Ephémérides (c'est-à-dire le mouvement orbital des objets du système solaire) et le Temps Universel (c'est-à-dire la rotation de la Terre).

Resolution No. 7
of the Executive Committee, on the proposal of the Working Group on Photographic Materials/Proposée par le Comité Exécutif, sur avis du Groupe de Travail sur les Matériaux Photographiques

Whereas the present multiplicity of plate sizes used by astronomers is extremely uneconomic, and

Recognizing that the existing investment in equipment not easily modified is too large to introduce a thoroughgoing standardization,

Being desirous of preventing further deterioration of the situation in future,

The International Astronomical Union recommends,

that, in so far as may be instrumentally feasible, astronomers and instrument designers plan future instruments and modify existing ones so as to use only the plate dimensions listed below or dimensions derivable from these by cutting.

Centimetre sizes

16 × 16, 18 × 13, 9 × 12, 24 × 24

Inch sizes

$3\frac{1}{4} \times 4\frac{1}{4}$,	5 × 7,	8 × 10,	4 × 10
(8.3 × 10.8 cm)	(12.7 × 17.8 cm)	(20.3 × 25.4 cm)	(10.2 × 25.4 cm)

It is recognized that in special circumstances there will be a need to order other plate sizes such as large ones for use in some astrographs and Schmidt telescopes and unusual sizes of long plates for spectroscopy. The resolutions implies only a voluntary restriction of demand variety in the medium size-range which it is hoped should lead to significant economies.

Considérant que la présente multiplicité des dimensions des plaques utilisées par les astronomes est extrêmement peu économique, et

Reconnaissant que les investissements dans des équipements difficiles à modifier sont trop importants pour que l'introduction d'une standardisation complète soit possible,

Mais désireuse d'éviter toute détérioration ultérieure de la situation actuelle,

L'Union Astronomique Internationale recommande

que, dans la mesure où cela est possible au point de vue de l'instrumentation, les astronomes et les ingénieurs chargés d'étudier les instruments futurs fassent des plans ou modifient les plans actuels de façon à utiliser seulement les dimensions de plaques dont la liste est donnée ci-après, ou des dimensions dérivant de celles-ci par un simple découpage.

Dimensions en centimètres:

16 × 16, 18 × 13, 9 × 12, 24 × 24

Dimensions en inches:

$3\frac{1}{4} \times 4\frac{1}{4}$,	5 × 7,	8 × 10,	4 × 10
(8.3 × 10.8 cm)	(12.7 × 17.8 cm)	(20.3 × 25.4 cm)	(10.2 × 25.4 cm)

Il est reconnu que dans des circonstances spéciales, il sera nécessaire de commander des plaques de dimensions différentes, telles que celles qui sont utilisées par certains astrographes et télescopes de Schmidt, et telles que les dimensions inhabituelles des longues plaques utilisées en spectroscopie. La résolution implique seulement une restriction volontaire dans la variété des exigences relatives à des plaques de dimensions moyennes, et l'on espère ainsi obtenir des économies significatives.

Resolution No. 8
Proposed by the Commission 17 (The Moon)
Proposée par la Commission 17 (La Lune)

On the lunar nomenclature

The assignment of names and permanent designations to features on the far side of the Moon will be postponed until the fourteenth General Assembly. As an interim measure, a Working Group will assign numbers to about 500 major lunar formations.

Sur la nomenclature lunaire

L'attribution de noms et de désignations permanents aux détails topographiques du côté de la Lune opposé à la Terre sera repoussée jusqu'à la quatorzième Assemblée Générale de l'UAI. A titre de mesure provisoire, un Groupe de Travail attribuera des numéros à environ 500 formations lunaires importantes.

Resolution No. 9
On the Resolutions adopted by the Commissions
Sur les Résolution adoptée par les Commissions

Considering the impracticability of giving individual attention to every resolution adopted by each of its 38 Commissions, and having full confidence in its Commissions,
this General Assembly *wishes to give its endorsement* to the Resolutions adopted by its individual Commissions, and *recommends* that astronomers give effect to these Resolutions in so far as they are able.

Prenant en considération l'impossibilité pratique d'accorder à chaque résolution adoptée par chacune de ses 38 Commissions une attention particulière, et affirmant la confiance complète qu'elle a en ses Commissions,
cette Assemblée Générale *désire exprimer son approbation* des résolutions adoptées par ses différentes Commissions, et *recommande* que les astronomes appliquent ces Résolutions dans toute la mesure du possible.

Commission 10 (Solar Activity/L'Activite Solaire)

The President reads the following resolutions, drafted for approval by Commission 10.

1. The Working Group of Commission 10 on Coronal Intensity Standardization,

Recognizing the importance of patrol measurements for a better knowledge of the solar corona and of its time evolution, as well as for an early warning of the arrival of active centers at the East limb,

Stressing that these measurements should be expressed in a homogeneous scale and be taken at a sufficiently large number of stations well distributed in longitude,

Aware of the difficulty of time-sharing problems on instruments during the limited observing periods available,

Recommends:

- That the authorities responsible for the scheduling of the instruments already in operation, or soon to be operative, stress equally the following three types of work:
  - patrol observations;
  - special purpose observations of the corona;
  - observations needed for technical improvements;
- That, in all stations which presently assure (or have in the past assured) patrol observations, the time allocated to these observations be at least maintained, or reestablished, to the minimum level required for a meaningful coverage; this applies to the K-corona as well as to the emission corona for those stations which are now equipped (or would soon be equipped) with a K-coronameter;
- That patrol observations be organized at the stations of Huancayo and the Hawaian Islands, which are particularly important on account of their longitudes and favourable meteorological conditions;
- That patrol observations be organized also at the stations of Irkutsk and Abastumani;
- That patrol observations be made with the Kodaikanal coronagraph;
- That steps leading to the temporary exchange of observers between different stations be encouraged;
- That, because of the important technical work (to be described somewhere else) which remains to be done in order to reach a homogeneous system of measurement, and which has been divided among its members, the Working Group continues its activities past the XIII General Assembly.

2. Recognizing the usefulness of well-specified international cooperative projects, particularly for better understanding of the problems of solar-terrestrial physics, but also for the study of solar activity itself, and bearing in mind the great significance of close international cooperation for present-day science,

Commission 10 of the I.A.U. recommends that IUCSTP promotes and organizes short-term cooperative projects during the coming years of the active Sun, provided that these projects are well prepared, will not overlap in time and will not place such a burden on the solar observers that their own research work would be influenced in an unfavourable way.

3. Commission 10, being informed about the resolution adopted by the COSPAR Working Group II during the London meeting (1967), in which the continuations and the rapid exchange of information on solar activity through regional warning centres is recommended,

wishes to endorse this resolution and recommends that solar observers continue their efforts to keep the Sun under permanent observation and to make data on current solar activity available for rapid world-wide dissemination.

4. Commission 10

— notes that the *Cartes Synoptiques de la Chromosphere Solaire* and associated catalogues give in a concise form an exhaustive description of solar activity including the location, size and progressive evolution of active regions and filaments;

— considers that, although similar information has recently been made available on a day to day basis, the synoptic presentation is more directly useful for the study of long term changes;

— notes that the *Cartes Synoptiques* have been used during recent years in a number of investigations of 27 days, yearly and cyclic variations of solar activity and associated terrestrial effects;

— considers that their value in such work is due to their availability for nearly 5 eleven-year cycles of solar activity and increases with time;

— therefore recommends the continuation of this publication under partial financial support from I.A.U.;

being aware of severe limitations in the resources of the Union and of the necessity to help new projects,

— proposes to reduce the subvention to this publication to 1500 U.S. dollars for the period until the XIV General Assembly.

5. Commission 10 recommends to continue the annual subvention of gold francs 1000,— for the *Heliographic maps of the photosphere* for the coming 3 years.

The *Heliographic maps* contain the sunspot groups, the plages and the evolution tables. They are compiled from observations of the Zurich Observatory and its branch stations in Locarno and Arosa as well as from many collaborating observatories. They are published on an international basis and since 1966 printed in English. The *Heliographic maps* are distributed in 500 copies to all astronomical observatories and to a large number of magnetic, ionospheric and geophysical observatories that are interested in solar activity. This series covers the last 30 years and was widely used in many geophysical researches, in statistics on sunspot activity and in recent years for the study of local magnetic fields on the sun. The maps are a necessary addition to the heliographic maps of the chromosphere published by the Meudon Observatory and to the heliographic maps of the corona published in the Quarterly Bulletin on Solar Activity.

The annual subvention granted by the I.A.U. covers about half of the printing costs in a year of low solar activity and about one third in a year of solar maximum. If the subvention granted in the last 20 years should be stopped, the Zurich Observatory would be faced with severe financial difficulties. The special character of the heliographic maps does not allow to publish them in an astronomical journal. Therefore, the continuation of the subvention would be highly appreciated.

6. Commission 10, having been presented a sample of the series of photographs of the Sun prepared by the Monte Mario Observatory in Rome and being informed about the plan to publish these as a Photographic Journal of the Sun, starting January 1968.

wishes to express its appreciation for this initiative and welcome this Journal as a valuable contribution to making basic information on the development of solar activity available to the scientific community.

All these resolutions were accepted.

Commission 15 (Physical Study of Comets/Etude Physique des Cometes)

Actions of Commission 15

Recommendation 1: Noting the extreme value of central repositories for and dissemination of cometary photographs and spectrograms, Commission 15 recommends the publication of an isophotometric atlas of comets on the basis of equidensities by the method of Richter and Hoegner, the publication of an Atlas of Characteristic Comet Photographs prepared by Donn, Rahe and Wurm, and the cooperation of all observatories in making their cometary material available for these purposes.

Recommendation 2: In view of the expanding potentials for cometary observations by new ground-based and space techniques, Commission 15 appoints a Coordination Committee for Observation of Comets and recommends the full cooperation of all observatories and the Central Bureau for Astronomical Telegrams, Cambridge, Mass., in planning observing programs, in reporting unusual cometary activity and in making special observations of comets.

Commission 16 (Physical Study of the Planets/L'Etude Physiques des Planètes et des Satellites)

Resolution III
Guide Lines for Naming Martian Craters

(1) The 1958 I.A.U. Martian Nomenclature (Trans. IAU, **X**, 259–263, 1958) is hereby reaffirmed with the understanding that 'features' refers to telescopically observed spots, dark and bright, not to craters. The approx. 120 names of dark and bright areas are regarded as 'provinces' whose boundaries may be defined more precisely as a result of increased image resolution.

(2) Within these 'provinces', bright and dark, craters and other tectonic structures occur. The most prominent of these may be named after deceased scientists and members of other suitable professions, as is customary for lunar craters.

(3) The number of names should be held reasonably small.

(4) Among the appropriate professional categories are: astronomers, mariners, geologists and geophysicists, physicists, mathematicians, biologists, chemists, astronauts, engineers, philosophers, artists and historians. Since only 10–20 categories will be introduced versus some 120 provinces, groups of adjacent provinces may be combined as larger districts in the assignments of crater names. An effort may be made to relate in an interesting manner professional groups to major surface features.

(5) Craters not named may be designated by coordinates or—as on the Moon—by reference to a nearby major crater, with an appropriate letter attached.

(6) The large area of Mare Sirenum (Areographic Longitude 163°, Latitude −33°) allows one category names only. Five craters are named (Figs. 1–4):

(a) Mariner IV picture 8: Ejriksson (50 km dia.).
(b) Mariner IV picture 10: Columbus (110 km dia.).
(c) Mariner IV picture 10: Magelhaens (110 km dia.).
(d) Mariner IV picture 11: Mariner (160 km dia.). Symbolic name.
(e) Mariner IV picture 16: Nansen (90 km dia.).

Résolution III
Directives pour la nomination des cratères de Mars

(1) La Nomenclature Martienne établie en 1958 par l'U.A.I. (*Trans. I.A.U.*, **X**, 259–263, 1958) est réaffirmée ici, entendu que les 'accidents' se réfèrent à des taches sombres et claires observées téléscopiquement, et pas à des cratères. Les 120 noms environ, de régions sombres et claires sont considérés comme des 'provinces' dont les limites pourraient se définir avec une plus grande précision avec l'augmentation de la résolution des images.

MARINER IV
PICTURE 8

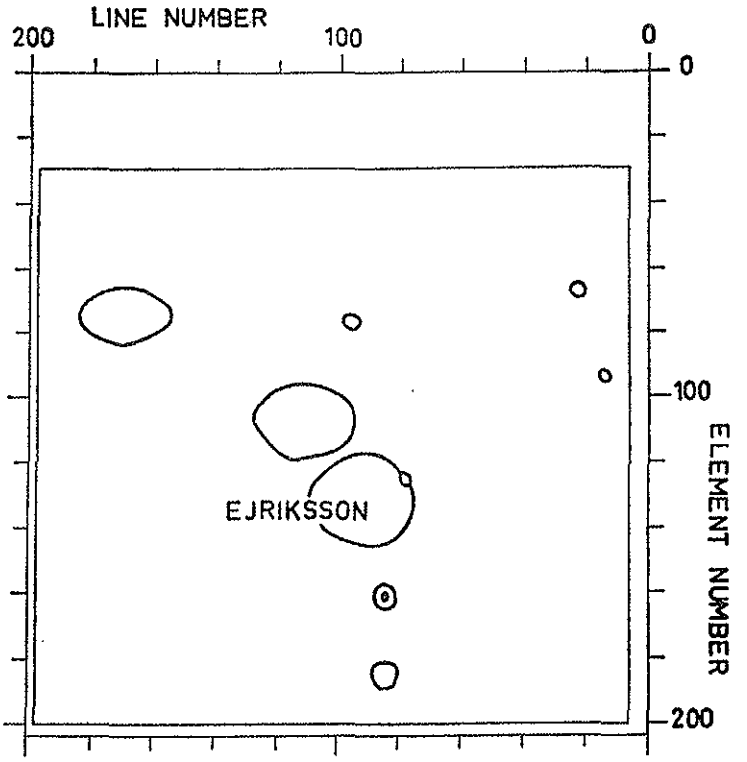

FIG. 1. Crater Ejriksson.

MARINER IV
PICTURE 10

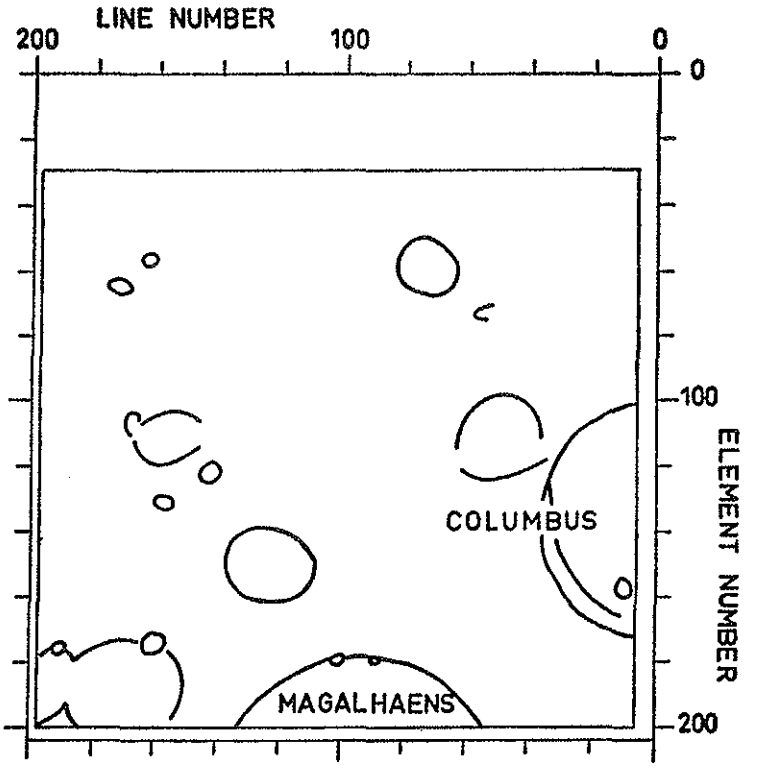

FIG. 2. Craters Columbus and Magelhaens.

MARINER IV
PICTURE 11

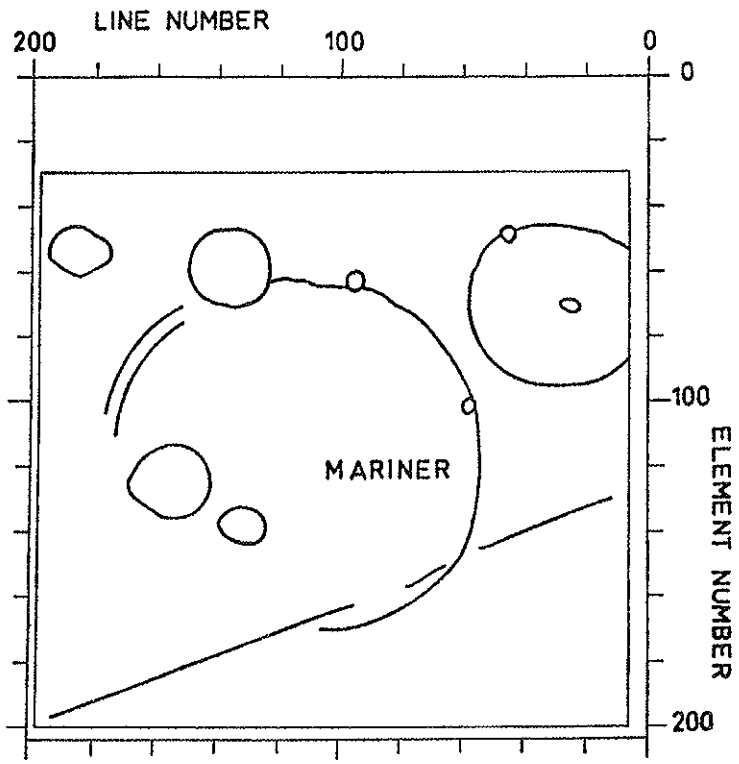

FIG. 3. Crater Mariner.

MARINER IV
PICTURE 16

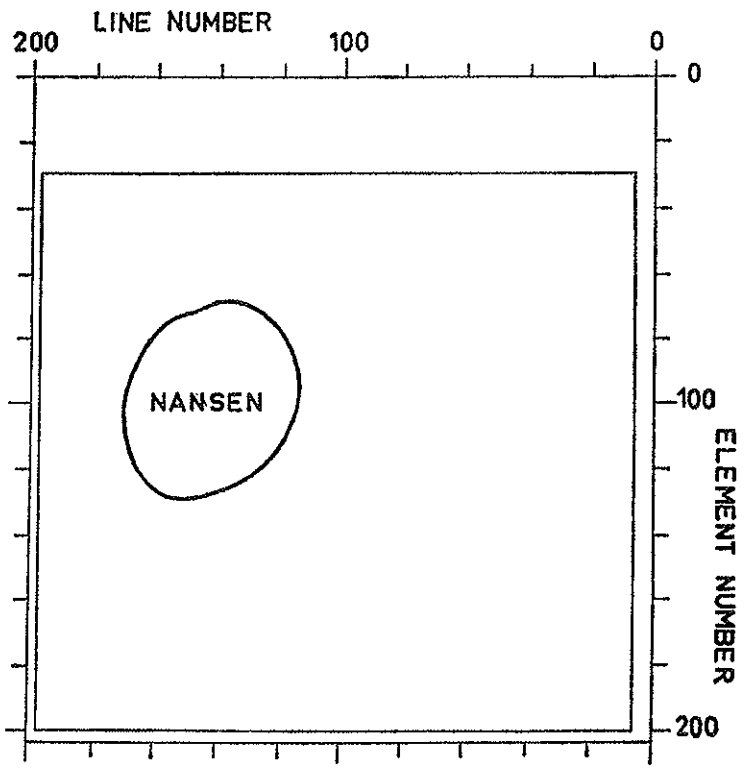

FIG. 4. Crater Nansen.

(2) Parmi ces 'provinces', claires et sombres, il y a des cratères et d'autres structures tectoniques. Les plus saillants d'entre eux peuvent être nommés d'après des scientifiques décédés et des personnes d'autres professions appropriées, comme c'est l'habitude pour les cratères lunaires.

(3) Le nombre des noms doit être raisonnablement restreint.

(4) Parmi les catégories des professions appropriées se trouvent celles des: Astronomes, Navigateurs, Géologues et Géophysiciens, Physiciens, Mathématiciens, Biologues, Chimistes, Astronautes, Ingénieurs, Philosophes, Artistes et Historiens. Puisque 10–20 catégories seront introduites contre 120 'provinces', des groupes de provinces adjacentes peuvent être combinées en districts plus vastes dans la désignation de noms de cratères. Un effort pourrait être fait pour rapporter d'une manière intéressante des groupes professionnels à des accidents majeurs de la surface.

(5) Des cratères non nommés peuvent être désignés par des coordonnées ou—comme sur la Lune—par référence à un plus grand cratère voisin avec une lettre appropriée attachée.

(6) La large région de Mare Sirenum (Longit. Aréographique 163°—Latitude − 33°) ne permet qu'une catégorie de noms seulement. Cinq cratères ont été nommés (figs. 1–4):

(a) Mariner IV Photo 8: Ejriksson (50 km. diam.)
(b) Mariner IV Photo 10: Columbus (110 km. diam.)
(c) Mariner IV Photo 10: Magelhaens (110 km. diam.)
(d) Mariner IV Photo 11: Mariner (160 km. diam.). Nom symbolique.
(e) Mariner IV Photo 16: Nansen (90 km. diam.).

Commission 16 decides the continuation of the life of the Working Group 'Martian Nomenclature' under the following form: G. P. Kuiper—Chairman; A. Dollfus, J. S. Hall, R. B. Leighton—Members.

Commission 19 (Variation of Latitude/Variation des Latitudes)

Résolution

(1) Les coordonnées du pôle instantané doivent être rapportées à une origine définie par les coordonnées initiales suivantes:

Mizusawa	+ 39°8′ 3″.602
Kitab	1″.850
Carloforte	8″.941
Gaithersburg	13″.202
Ukiah	12″.096

Cette origine est appelée Origine Conventionnelle Internationale (OCI).

Recommandations

(1) Considérant que le problème de la dérive continentale est d'une grande importance et que les vitesses et les directions des dérives relatives des continents pourraient être confirmées et mesurées par des observations astronomiques, l'UAI recommande aux autorités concernées:

(*a*) que les stations existantes qui emploient soit des lunettes photographiques zénithales, soit des astrolabes Danjon et qui sont situées sur des parallèles suffisamment proches fassent des observations conjointes du temps et de la latitude. Cela implique que les mêmes étoiles appartiennent aux programmes d'observation de chacune des stations de la chaîne,

(*b*) que toutes les stations internationales des latitudes en fonction sur le parallèle nord de 39°8′ soient équipées de lunettes photographiques zénithales et qu'elles fassent avec ces instruments des observations régulières et conjointes du temps et de la latitude sans cesser les observations de la latitude avec les instruments visuels,

(*c*) qu'une chaîne similaire de lunettes photographiques zénithales soit établie dans l'hémisphère austral à une latitude voisine de − 34°, en Australie, en Afrique et en Amérique du Sud (en Argentine et au Chili),

(*d*) que les observatoires du Mont Stromlo, du Cap, de La Plata et de Santiago forment une chaîne d'astrolabes et fassent des observations conjointes du temps et de la latitude,

(*e*) que, lorsque de nouvelles stations sont établies, elles soient placées en des lieux tels qu'elles puissent faire partie d'une chaîne existante ou en former une nouvelle,

(*f*) qu'une distribution d'astrolabes régulière en latitude soit conservée afin d'étudier les dérives entre stations de latitudes différentes,

(*g*) que soit étudiée la possibilité d'utiliser des satellites artificiels et des cataphotes sur la lune, afin de mesurer la dérive des continents avec grande précision.

Commission 20 (Minor Planets, Comets and Satellites/Petites Planètes, Comètes et Satellites)

The following resolutions were then passed without objection.

(1) 'Commission 20 recommends that the Minor Planet Center at Cincinnati continue to issue the *Minor Planet Circulars*, and that a sum of $ 500·00 per annum be made available to the Minor Planet Center for defraying the necessary expenditures.'

(2) 'Commission 20 recommends that the new improved list of values of g (magnitude at unit distances) prepared by Dr T. Gehrels be adopted for the magnitudes of these minor planets, and that the list be printed in the *Transactions IAU*.'

(3) 'Commission 20 recommends to all observers who have the appropriate facilities the urgent need for making early plans to observe (1566) Icarus by optical ($12 <$ magn. < 20) and electronic means during the coming apparition and the close approach (0·04 AU) of 1968 June 14–15, and notes that a reliable ephemeris based on the observations of 1966 is now available.'

(4) 'Commission 20 recognizes that the use of large telescopes for astrometric observations is essential to the study of the origin and physical evolution of comets and minor planets and therefore:

calls the attention of observers to the values of this area of work;

urges sympathetic consideration by the appropriate authorities of requests for observing time on suitable instruments;

solicits the cooperation of those observatories that have facilities for measurement and reduction of plates, including collections of star catalogues;

recommends the development of additional facilities, automatic insofar as practicable, for the measurement of plates up to 25 × 25 cm; and

commends the efforts of Commission 23 toward calculation of improved values of plate constants for the Astrographic Catalogue.'

The Commission then agreed to the recommendation of the President on the compositions of the Organizing Committee (namely: Arend, Herget, Hirose, Wood) and the Working Group on Comets (namely: Roemer (Chairman), Candy, Kresak, Makover, Marsden, Sitarski).

Commission 21 (Light of the Night Sky/La Luminescience du Ciel)

The following presentations were made to the Commission, all on August 23 except for that of Kordylewski which was presented informally to a small group on August 29.

Speaker	*Topic*	*Reference*
Ščeglov	H alpha observations	*Astr. J. USSR* **41,** 331, 1964 *Astr. Circ. USSR* **44,** 414, 1967 *Astr. Circ. USSR* **44,** 411, 1967
Huruhata	Rocket Observations of 6300, 5577, 5300	*Space Research* **VIII** (in press)
Dachs	Airglow observations at Toumeb (S.W. Africa)	
Roach	(*a*) Summary of IQSY Observations (*b*) Galactic Light (*c*) Cosmic Light (*d*) New photometric map of the Milky Way	(*a*) *Annals of the IQSY*, 1967 (in press) (*b*) *Modern Astrophysics*, 1967 (in press) (*c*) *The Geophysical Jour*, 1968 (in press)
Weill	(*a*) Predawn enhancement of 6300 (*b*) Observations of NI 5200	(*a*) *C. r. Acad. Sci.*, **264,** 1685, 1967 (*b*) *C. r. Acad. Sci.*, **264,** 1286, 1967
Lebedinsky	Airglow observations from Cosmos 92	*Space Research* VII (1967)
Weinberg	Zodiacal Light Conference, Jan–Feb, 1967	Summary Report, Hawaii Institute of Geophysics HIG 67-13
Hoffmeister	Visual Observations of the Zodiacal Light	
Simpson	Observations of the Earth-Moon Libration Clouds	*Physics Today*, **20,** 39, 1967
Kordylewski	Observations of the Earth-Moon Libration Clouds	
Courtès	Ultraviolet Observations of the Zodiacal Light	*L'Astronomie*, Juin–Juillet, 1967

Recommandation S-1

Le Comité Consultatif pour la Définition de la Seconde

Récommande

que la seconde, unité de base du Système International d'Unités, soit définie dans les termes suivants:

La seconde est la durée de 9192631770 périodes de la radiation correspondant à la transition entre les deux niveaux hyperfins de l'état fondamental de l'atome de césium 133,

que la seconde telle qu'elle fut définie par décision du Comité International des Poids et Mesures à sa session de 1956 soit désignée sous le nom de 'seconde des éphémérides'.

H. Barrell pointed out that two other recommendations call for further investigations of atomic frequency standards and for joint meetings of representatives of the various international scientific or technical Unions concerned, to study the application of this new definition under the coordination of the *Comité International des Poids et Mesures.*

He drew attention to the declaration of the CCDS which develops these points insisting, in particular, on the necessity of maintaining Ephemeris Time.

W. Markowitz and *N. Stoyko*, representatives of the IAU on the CCDS, expressed their accord with this new definition.

J. Terrien described the procedure that would be followed before the adoption of the final text of this recommendation by the General Conference of Weights and Measures. The form of the text may be modified to exclude the Ephemeris Second from the International System, but the Conference will not interfere with the astronomical use of Ephemeris Time. The International System is a consistent and limited system and does not exclude other units. Since there will not be a formal abrogation of the ephemeris second, the astronomers should be free to use Ephemeris Time.

W. Markowitz expressed the wish that, in the case of a statement of the General Conference that the ephemeris second is not part of the International System of Units, it should be formally recognized that it remains part of the IAU system of astronomical constants. This suggestion was discussed and it was generally agreed that such a statement should be transmitted to the General Conference.

W. Markowitz drafted a resolution concurring with the proposed definition of the second, but pointing out that the ephemeris second is part of the IAU system of astronomical constants. After discussion this resolution was modified and adopted by the commissions. It was later approved by the General Assembly in the following form:

Resolution 1

Commissions 4 and 31 recommend that the following views and information be transmitted to the General Conference of Weights and Measures. See Resolution No 5

There was more discussion on the third recommendation of the CCDS on the future activity of the *Comité International des Poids et Mesures* in the application of the new definition. *J. Terrien* assured the members of the commissions that there would be no modification of the third recommendation of the CCDS, which reads as follows:

Recommandation S-3

Le Comité Consultatif pour la Définition de la Seconde

Recommande

que le Comité International des Poids et Mesures suscite une réunion comprenant des représentants de diverses organisations telles que Bureau International de l'Heure, Union Astronomique Internationale, Union Géodésique et Géophysique Internationale, Union Radioscientifique Internationale, Union Internationale des Télécommunications (Comité Consultatif International des Radiocommunications), pour étudier les problèmes soulevés par l'application des décisions prises concernant la nouvelle définition de l'unité de temps.

II. EPHEMERIS TIME

D. H. Sadler made the following remarks on the various time-scales now available.

The atomic time-scale, that he proposes to call *atomic clock time* (temps atomique intégré), will be a valuable means of measuring intervals of time and will replace E.T. as the reference in the study of the irregularities of the rotation of the Earth.

The measure of Ephemeris time (and hence A.T.–E.T.) is subject to four kinds of limitations.

a) *Limitation of principle*: it can be obtained practically only through observations of the Moon.

b) *Limitation of physical knowledge*: the Sun-Earth-Moon system is not conservative.

c) *Limitation of theory*: errors in the theory of the motion of the Moon and in the astronomical constants.

d) *Limitation of observations*: arising in the practice of observing the Moon with respect to the stars, or on the meridian.

L. Essen was not in favour of the expression 'atomic clock time' and doubted whether it will be possible to measure significantly A.T.–E.T. *T. C. van Flandern* pointed out that this would allow the identification of the tidal friction.

A short spirited discussion of the inherent accuracies of the various time scales followed. *G. M. R. Winkler* and *J. Terrien* stressed the opinion that both atomic and ephemeris times are physical uniform times. Only the practical precision with which they can be measured is different.

In a later meeting, *D. H. Sadler* proposed a resolution emphasizing that the new definition of the second does not suppress the necessity of observing U.T. and E.T. This was supported by *G. M. Clemence*, and after some discussion the resolution was approved by the commission and was subsequently adopted by the IAU General Assembly.

Resolution 2

See Resolution No. 5

J. Terrien indicated that the International Committee of Weights and Measures will probably approve such a resolution.

III. RELATIVISTIC EFFECTS

G. M. Clemence, in his introductory remarks, stressed the fact that, in the last 10 years, experiments have shown the reality of the slowing of clocks in motion with respect to others (**1**) as well as in a stronger gravity field (**2**). However, some attacks on Einstein's theory of general relativity have recently been made, for example by R. H. Dicke, who found a minor flattening of the Sun that would suffice to explain part of Mercury's motion of the perihelion. On this point, *C. G. McVittie* criticized the theory of the Sun's interior used by Dicke and suggested that the observation of the solar disc should be continued during two solar cycles.

G. M. Clemence reported on work with *V. Szebehely* in which they computed the difference between the parameters t and s of the basic formula.

$$\frac{\mathrm{d}t}{\mathrm{d}s} = 1 + \left(\frac{1}{r} - \frac{1}{2a}\right) \times \frac{2GM}{c^2}$$

where a is the semi-major axis of the Earth's orbit, r the radius vector, GM is the heliocentric constant of gravitation, and c the speed of light.

They provisionally identified s with the proper time of an orbiting clock and t with Ephemeris Time. They deduced that the time indicated by the clock departs periodically from its mean value by 0·0017 second.

G. C. McVittie commented on this identification which he had also made using the Schrodinger approximation (**3**).

N. Stoyko stressed the importance of measuring A.T.–E.T. regardless of their theoretical significance. He also pointed out that O. Costa de Beauregard gave formulae analogous to Clemence in 1957 while Fokker found the same numerical results by numerical integration.

W. H. McCrea commented on the formula giving the relativistic red shift and pointed out that one cannot observe the gravitational potential, but only its gradient. One has:

$$h\nu = h\nu_0\left(1 - \frac{M}{r}\right)$$

ν_0 is observed by an observer linked with the emitter, while ν is the frequency at zero potential.

L. Essen recommended an experimental approach to the problem and stressed the difficulty introduced by the fact that the reference frames linked with various clocks are different.

G. Becker commented upon Aoki's and Clemence's formula and wished to modify it, taking into account the presence of the clock on the Earth. He believed that the Moon revolving around the Earth is comparable to an atomic clock and that, therefore, E.T. observed with the Moon should be identical to A.T. and will not present the annual term given by those authors.

S. Aoki agreed with this point, but pointed out that Ephemeris Time is being defined with the Sun and, consequently this term is real in the definition. He believes that the theory of the motion of the Sun should include relativistic effects in order to define a truly uniform coordinate time E.T.

W. Markowitz pointed out that from a practical point of view it is unlikely we will soon be able to check any annual variation of atomic time. The problem may become important when a precision of 10^{-14} is attained in atomic clocks.

M. Missana remarked that in the computation of the effect, it should be noted that in relativity theory, the distances must not be identified with the radius-vectors as in classical mechanics.

In a written contribution which arrived too late for presentation at the meeting, *R. H. Dicke* deduced a variation of the rate of an atomic clock of $6{\cdot}6 \times 10^{-10}$ (total increase in clock rate from winter to summer).

References

1. Frische, D.H., Smith, J.H. 1963, *Am. J. Phys.* **31**, 322.
2. Pound, R.V., Rybka, G.A. 1960, *Phys. Rev. Lett.* **4**, 337.
3. McVittie, G.C. 1932, *Mon. Not. R. astr. Soc* **92**, 868.

IV. COORDINATED UNIVERSAL TIME

G.M.R. Winkler put forward a proposal to increase the tolerance of the representation of UT2 by UTC to 300 ms and to authorize the Director of the Bureau International de l'Heure (BIH) to change the frequency off-sets at the beginning of any month.

H.M. Smith recalled that two systems of coordinated time exist: the one of the BIH and the one in use in the USSR. They are similar in principle.

D. Belocerkovskij confirmed that the coordination with the BIH in frequency will continue, but that the maximum tolerance in UT2–UTC is limited to 50 milliseconds.

G.M.R. Winkler stated that he would withdraw his proposal if the present systems of the BIH were adopted universally.

A general discussion on the proposal by Winkler took place. The following points were raised:

The navigators would accept a tolerance of 200 ms (instead of the present 100 ms) but not larger (*D.H. Sadler*).

No major change in the principles of UTC should be introduced since it has proved useful (*H.M. Smith, W. Markowitz, L. Essen*).

An increase of the tolerance, as well as the possibility of changing the frequency other than once a year, would facilitate the work of the BIH and permit less frequent changes (*G.M.R. Winkler, B. Guinot, N. Stoyko*).

Some improvements in the UTC system appear necessary to satisfy the needs of the highest-precision users (*G.M.R. Winkler*).

Such changes should be accepted by all users and hence should be referred to UIGG, URSI and CCIR (*W. Markowitz*).

B. Guinot asked for statements by users on whether they prefer offsets in frequency or steps in time.

The discussion was continued in a subsequent session. After some informal discussions *D. Belocerkovskij* indicated that, if possible, the tolerance of the USSR system will be raised to 100 ms. As a consequence it was decided to stress the desirability of a single uniform system and it was agreed that it was inopportune to propose an increase in the tolerance. *B. Guinot* proposed the following resolution which was adopted unanimously.

Resolution 3

L'Union Astronomique Internationale

reconnaissant

(a) la nécessité de la coordination des émission de signaux horaires

(b) la nécessité de réduire le nombre des décalages de fréquence et d'ajustements par sauts

recommande

(1) que la coordination des émissions de signaux horaires dans le système appelé 'temps coordonné' (TUC) défini par le CCIR à sa réunion plenière de 1966 (Recommendation 374-1, CCIR Documents of the XIth Plenary Assembly, Oslo 1966, Volume III, p. 281, 282), soit universellement étendue,

(2) que la possibilité d'accroître la tolérance pour la différence TU2–TUC soit étudiée par les organisations concernées.

Two other resolutions, one presented by *N.* and *A. Stoyko* and the other by *G.M.R. Winkler* were discussed. Their aim was to define and to establish a unique international atomic time scale under the responsibility of the BIH and to encourage national time services to make a broader use of atomic frequency standards in order to build local time scales.

B. Guinot indicated that the BIH had experience in constructing an atomic time scale (A.3) by integration and that this technique gives rise to errors due to the instability of the standards. It is therefore necessary to compare as many time scales as possible. These time scales should be based on counts and their origin should not be linked to a given phenomenon such as an epoch in U.T.

After discussion the final wording of the resolutions was presented and adopted.

Resolution 4

Commissions 4 *et* 31 *recommandent*

1. l'établissement d'une échelle du temps atomique en prenant pour fréquence de l'étalon à césium, 9 192 631 770 Hz et qui soit d'accord approximativement avec le TU2 à 0 Heure 1er Janvier 1958, compte tenu du changement des longitudes conventionnelles,

2. que le BIH coordonne la publication des résultats de la comparaison des horloges atomiques de différents établissements en utilisant le transport des horloges atomiques par avion.

Resolution 5

Commissions 4 *and* 31 *of the International Astronomical Union recommend:*

(i) That the BIH compute an International Atomic Time Scale comprised of independent time scales of the major national time services.

(ii) That this time scale, based on the experiences gained with the experimental scale A3, be computed similarly and published in the form of corrections to the contributing time scales with respect to the international scale.

(iii) That the frequency averaging and integrating as well as time averaging should be used in the computation, but greater weight should be given to time averaging wherever possible.

(iv) That the national time services be encouraged in turn to maintain their time scales independently, based on a broader use of atomic frequency standard resources, and that they also study in cooperation with the BIH the conditions under which different time scales in different countries can be brought into coincidence with that of the BIH.

This resolution was adopted unanimously.

B. Guinot wished to change the name of A.3 to 'International Atomic Time Scale'.

Commission 41 (History of Astronomy/L'Histoire de Astronomie)

The resolutions adopted are as follows:

1. *For the General Assembly*

   See resolution No. 4

2. *For the General Assembly*

   See resolution No. 3

3.

Commission 41 considère comme très utile la composition et l'édition de la Bibliographie annuelle sur l'histoire de l'astronomie qui mérite tout le secours.

Commission 41 voulant assurer la totalité de la Bibliographie demande à leurs membres et membres-consultants de bien vouloir prendre la tâche et la responsibilité d'envoyer aux compilateurs de la Bibliographie ses résultats de depouillement des éditions du caractère générale et celles des académies et des universités de leurs pays.

Commission 41 s'adresse aux Comités Nationaux de l'UAI des pays qui ne sont pas présentés à la Commission 41 de choisir une personne qui pourra être responsable pour le même sujet.

Commission 41 prie le Président de la Commission 41 de s'adresser aux institutions astronomiques des pays qui ne sont pas présentés à l'UAI, en les demandant le même secours.

Commission 41 rapelle à tous auteurs la nécessité d'envoyer aux compilateurs de la Bibliographie les tirages-à-part ou les données bibliographiques précises.