

## WORKING GROUP 1 (GROUPE DE TRAVAIL 1)

NUMERICAL DATA FOR ASTRONOMERS AND ASTROPHYSICISTS  
(DONNÉES NUMÉRIQUES POUR LES ASTRONOMES  
ET LES ASTROPHYSICIENS)

PRESIDENT: Ch. M. Sitterly.

SECRETARY: C. W. Allen.

## GENERAL COMMENTS

During the two sessions held by this Group, a lively and widespread interest in data handling was indicated. More than 80 persons attended each session and 16 countries were represented. The comments of 14 speakers, most of whom are operating data centers in various fields of research, stimulated active discussion. The serious need for coordinated effort and constructive planning with regard to Data Centers was striking. Ignorance of existing centers was apparent. Inter-Commission cooperation in publicizing all centers within the Union must be stimulated.

## DATA CENTERS

An appraisal of the purpose, method of operation, personnel and future outlook of each Data Center is a basic step toward constructive future planning. Within a given Center three types of work are involved:

(a) *Input*. This usually requires a continuing literature search – past, present and future. Existing abstracting services supplemented by individual surveys of current periodicals relevant to each field provide this information.

(b) *Critical Analysis of Data Obtained from the Literature Search*. Here, there is not unanimous agreement, but, in general, a Center that produces reliable critical data is more promising and more secure than one whose output is completely uncritical. Unreliable data will tend to discredit the Data Center, and the expense of operating the Center is justifiable only for reliable data.

D. S. Evans provided a model example of Numerical Data Procedure in describing the preparation of The Radial Velocity Catalogue. He appraised the data with extreme care and judgment before accepting them and drew the moral 'Do not go to a computer until the data are correct'. Errors propagate.

(c) *This leads to the third process – Output*. Publication of critically analyzed data in standard form at regular intervals is desirable. Response to inquiries, as far as is feasible, increases the justification for maintaining the Center. Distinction must be made between the Data Center (for analyzed data only) and the Information Center (for uncritical information).

Much emphasis was placed on the necessity of assembling the data in machine-readable form. This is well-illustrated in connection with Star Catalogues, which were widely discussed and which include a number of specialized topics for which data are needed by astronomers. The catalogues must be key-punched and kept up to date. Codification for machines is needed and a single system for the identification of a star is desirable. All agreed that the combining of catalogues presents a serious problem. This requires critical appraisal of data. Cross-indexing demands a skill beyond that of a computer. Equally important consideration must be given to the question of what data to include for a star. It was again stressed that the propagation of errors in the various catalogues constitutes a serious problem.

The specific problems connected with Star Catalogues are embodied in a more general report prepared by H. Abt. He is Chairman of a special Committee appointed by the Astronomical Society of the Pacific, to consider the feasibility and desirability of establishing an Astronomical Data Center. His report contains a number of pertinent suggestions on recovering published data about

individual stars, star clusters and the like, so that statistical studies of objects with specific characteristics can be made. This study extends the scope to the study of galactic structure. This report will be published in the *Publ. Astron. Soc. Pacific*.

Attention must, also, be given to the formation of new centers as the need develops. It was suggested that one might be planned on numerical experiments and theoretical work. For example, data on stellar models could be put in machine-readable form and stored.

The need for a catalogue of pulsars was mentioned, along with the desirability of forming a center to deal with radio and X-ray sources.

In general, the handling of data in any center must be systematic and follow sound general guidelines that have been well tested.

#### METHOD OF PROCEDURE

The suggestions for handling numerical data were varied, but the willingness to discuss the problems openly, and to cooperate in an effort to solve them, was reassuring. Although a completely mechanized center with a hook-up among observatories is visualized, the trend appeared to favor starting on a small scale. Coordination is urgently needed, and a center for centers may be desirable, but there is the possibility of having an overall central agency functioning as a broker for individual centers. To some it appeared to be too soon for repositories.

With regard to mechanization, it was proposed that astronomers attempt to use University computers that operate on a non-profit basis. It is desirable to use the same type of machines, so that programs are interchangeable. A circular letter requesting information on the type of machine format used in various centers might be useful.

The important task assigned to the Group can possibly be handled by a Commission, or by subcommittees in each Commission concerned. At least four such groups under the Commissions are now actively engaged in this type of work.

As a result of the present meeting, 16 centers, representing eight countries, have reported to the Working Group, which is an encouraging start.

In view of the ideas suggested during the course of these meetings, the Working Group made the following recommendations:

1. That a Permanent Working Group be established;
2. That the first task of the Permanent Working Group shall be to centralize information on existing Data Centers and distribute this information through the IAU Information Bulletin. Information on existing lists of errors in Catalogues should, also, be distributed.

The first recommendation was accepted by the General Assembly. Details are being worked out regarding the membership of this Permanent Working Group.

CHARLOTTE MOORE-SITTERLY, Chairman

*Washington, D.C., U.S.A. 24 September, 1970*

#### SUPPLEMENT TO REPORT

Working Group 1 (Brighton): C. W. Allen, T. Lederle, M. Migeotte, E. L. Schatzman; C. Moore-Sitterly, Chairman.

Speakers at Two Sessions held in Brighton:

The Members of the Group, C. W. Allen, T. Lederle, M. Migeotte, E. L. Schatzman, C. Moore-Sitterly and W. P. Bidelman, D. S. Evans, Ch. Fehrenbach, A. Hynek, J. Jung, P. Lacroute, W. J. Luyten, J. B. Sykes, G. A. Wilkins

Recommendation 3 (Brighton). That the main Data Center Leaders shall constitute the Permanent Working Group. The following names are proposed:

G. A. Wilkins, Chairman	C. Jaschek
H. Abt	J. Jung
W. P. Bidelman	T. Lederle <sup>1</sup>
D. S. Evans	V. B. Nikonov
R. H. Garstang	N. G. Roman
R. Giacconi	F. G. Smith
B. Hauck	J. B. Sykes
J. A. Hynek	H. M. Van Horn
	R. Wilson

Additional members may be co-opted.

#### IAU SUB-COMMITTEES AND INTER-COMMISSION COMMITTEES

Commissions 4, 7, 8, 26

Working Group within Commission 4 – Ephemerides  
Working Group with IAU, COSPAR and Paris Office  
Combined Data and Information Center

Commissions 5, 9, 38, 46

At Joint Session agreed to form an information center with A. G. Velghe Director

Commission 14

Committee 2 Transition Probabilities  
Committee 4 Structure of Atomic Spectra  
Committee 5 Diatomic Molecules

Commission 34

Data on Planetary Nebulae – will centralize.

Commission 45

Spectral Classifications and Multi-band Color Indices – Ch. Fehrenbach.  
Working Group

#### DATA CENTERS REPORTED TO WORKING GROUP 1 SEPTEMBER 1970

Atomic Energy Levels, W. C. Martin, Natl. Bur. Std., Washington, D.C., 20234, U.S.A.

Cross Sections for Collisions of Electrons and Photons with Atoms, Ions and Small Molecules,  
L. J. Kieffer, Joint Institute for Laboratory Astrophysics, Boulder, Colorado, 80302, U.S.A.

Eclipsing Binaries, Photoelec. Obs. publ., continuing file of data, F. B. Wood, Univ. of Florida,  
Gainesville, Florida, 32601, U.S.A.

Ephemerides, Planetary Data, Star Catalogues, G. A. Wilkins, Royal Greenwich Obs., Herst-  
monceux Castle, Hailsham, Sussex, U.K. – R. L. Duncombe, U.S. Naval Obs., Washington, D.C.,  
20390, U.S.A. – Paris center

Extra-Galactic Objects, J. D. Wray, Dearborn Observatory, Evanston, Illinois, 60201, U.S.A.

Globular Clusters, Helen Sawyer-Hogg, David Dunlap Obs., Richmond Hill, Ontario, Canada  
Observatories, Instruments (Computer listings) etc., A. G. Velghe, Obs. Royale de Belgique,  
Uccle-Brussels, Belgium

Planetary Research Center, W. A. Baum, Lowell Observatory, Flagstaff, Arizona, 86001, U.S.A.

Pulsars-Center needed, Consult R. Giacconi, 11 Carleton St., Cambridge, Massachusetts, 02142,  
U.S.A.

Star Catalogues, J. Jung, Stellar Data Center – Strasbourg

Radial Velocity Center – Marseille

T. Lederle, Astronomisches Rechen-Institut, Heidelberg, G.F.R.

C. O. R. Jaschek, La Plata, Argentina

P. W. Hill, University Obs., St. Andrews, Fife, U.K.

See, also, Ephemerides (above).

Radio Sources, W. N. Brouw, Sterrewacht Leiden, Leiden, The Netherlands

Master List – Ohio State Univ.

Radio Astronomy – California Institute of Technology.

Data on stars and galaxies.

Spectroscopic Binaries, A. H. Batten, Dominion Astroph. Obs., Victoria, B.C.

Transition Probabilities, W. L. Wiese, Natl. Bur. Std., Washington, D.C., 20234, U.S.A.