The Multinational History of Strasbourg Astronomical Observatory

VISTAS INTO THE CDS GENESIS

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Abstract. This chapter gathers together a few milestones of the pre-CDS years marking the advent of astronomical data centers. Two chronologies are reviewed: one essentially at the level of the International Astronomical Union (IAU), and the other one centered on the preparatory steps to the official creation, in 1972, of the *Centre de Données Stellaires (CDS)* in Strasbourg. Some tentative explanations to CDS' long-term success are put forward.

1. The Advent of Data Centers

The 14^{th} General Assembly (GA) of the International Astronomical Union (IAU) was officially declared open on 18 August 1970 in Brighton (UK) by a freshly appointed (June 1970) Secretary of State for Education and Science who was going to stay in history as the Iron Lady after three terms as British Prime Minister (1979-1990). During her opening speech, Margaret Thatcher stressed the contributions made by government-supported establishments such as the Royal Observatories at Herstmonceux and Edinburgh. The Royal Greenwich Observatory (RGO) located at Herstmonceux actually moved to Cambridge in 1990 before being definitively closed on 31 October 1998.

That 14^{th} IAU GA will however stay in history, for what concerns us here, as the first one where the issue of astronomy-related data centers has been officially debated at specific meetings.

This was prepared by various steps expressing the fact that, towards the end of the 1960s, the idea of data centers (conceptually in the continuation of cataloguing) had been popping up here and there among astronomers

together with individual initiatives setting up what would be seen today as embryonic materializations.

At the level of the IAU, a first document dated June 1969 and directed by the then IAU General Secretary L. Perek to the members of the IAU Executive Committee (EC) can be singled out. As it is an excellent summary of the spirit of the times, this document is reproduced *in extenso* hereafter.

INTERNATIONAL ASTRONOMICAL UNION
Union Astronomique Internationale

EC 32 DOC. 11 a

TO THE MEMBERS OF THE EXECUTIVE COMMITTEE

Prague June 1969

Dear Colleague,

Recently I had the opportunity to discuss some problems of astrophysical data with C. Jaschek, who draw [drew?] my attention to his paper in the PASP 80, 654, 1968. In what follows I tried to formulate the problem on somewhat more general lines.

The problem of making Scientific Information accessible to all users received much attention in recent years. Thus:

- UNESCO[1] and ICSU[2] created a committee for UNISIST[3] – a World Science and Information System,
- ICSU created a special committee CODATA – Committee on Data for Science and Technology which is very active in the field of spectroscopy (our representative in CODATA is Mrs. Moore-Sitterly, former President of Commission 14),
- the computing of data for astronomical yearbooks had successfully been coordinated and resulted in an important saving of efforts,
- astronomical bibliography is now handled by modern methods in Astronomy Abstracts[4] which will start appearing soon,
- etc.

As an intermezzo, imagine an astronomer who is interested in a rather faint star and would like to know if it has an MK classification. He would look through 5, 10, 100 papers, according to his temperament, but would certainly give up his search before half through the relevant literature. He would then probably travel to the nearest observatory with a good spectrograph, take the plate and determine the type. Or, he would get interested in another project

[1]United Nations Educational, Scientific and Cultural Organization.

[2]International Council of Scientific Unions.

[3]Universal System for Information in Science and Technology.

[4]Renamed as *Astronomy and Astrophysics Abstracts*, the continuation of the *Astronmischer Jahresbericht* launched in 1899 by W.F. Wislicenus in Strasbourg (see Duerbeck 2005).

and shelve that particular star. This situation is evidently undesirable and unfortunately it is not limited to the MK spectral classes. It concerns the whole field of data resulting from astrophysical observations.

We could imagine other painful situations such as that of two astronomers observing the same object under different names[5] ... but let this be left to your phantasy.

It may be concluded that information scattered over a large number of papers is for all practical purposes inaccessible to individual scientists. Unless the data are compiled in a systematic and homogeneous way, the compilation is kept up to date, and the dissemination made easy, the observed data cannot be used.

The areas with which we should be concerned are in particular:

- radial velocities
- spectral types
- rotational velocities
- photoelectric magnitudes
- orbits of visual binaries
- orbits of spectroscopic binaries
- catalogues of bright stars
  - binaries
  - variable stars
  - planetary nebulae
  - diffuse nebulae
  - star clusters
  - galaxies
  - radio sources
  - X-ray sources
  - quasistellar sources
- etc.

Some of the above lists or catalogues do exist, were recently published and are excellent from all points of view, but we cannot be sure that:

1. All necessary catalogues really do exist,
2. The catalogues are reissued at proper intervals, which may differ for each of the above items,
3. The catalogues are organized in the best possible way,
4. The material in all areas, where it is desirable, is compiled at one and only one place, that there are no gaps and no duplications,
5. All objects, in particular of newly discovered classes, are designated by the same names or symbols by all astronomers.

In the past the IAU contributed in a substantial way to coordination. The names of variable stars have been accepted by everybody, and the same applies to the lunar nomenclature of the near side (and we hope that that of the far side will be universally accepted, too). It is not necessary to enumerate all the international projects where the IAU played an important role of coordinating. I feel that the IAU should assist the astronomical community also in this case.

[5]This actually happened without the two authors realizing they were talking of the same object (a star in that case).

In my personal views, the situation could be improved either by setting up an ad hoc committee or by entrusting the task of coordination to Commission 5. The task would consist of:

1. Convening all those interested in the problem during the General Assembly in Brighton,
2. Stimulating the interest of Commissions,
3. Establishing general principles for the collection and dissemination of data.

All further actions should depend on the Commissions, in particular:

1. Deciding what material should be compiled and in which way it should be kept and disseminated,
2. Arousing interest of institutions and individuals who are in a position to act as data centres,
3. Urging individual observers to transmit their data to the centres,
4. Naming newly discovered objects,
5. Investigating possibilities of printing catalogues or lists at convenient intervals.

May I have your comments, either in writing or at the Executive Committee meeting?

L. Perek
General Secretary

One remains impressed by the clearsightedness of the detailed problematics, at a time it was not yet fully nor acutely emphasized by the *massification* of data and by their recording plus storage in machine-readable formats.

The paper by Jaschek (1968) mentioned in the opening paragraph of that IAU document discusses some aspects of the collection and cataloguing of observational data. It recommends several data collection centers for storing information and disseminating it at convenient intervals to the scientific community. Jaschek, who will become in 1974 the second CDS Director, brings up a number of interesting considerations such as:

"The principal advantage offered by [a data center] would be the fact the cataloguing would be done as a full-time job on a permanent and secure basis" [...]
"critical evaluations [...] require professional astronomers to do the job".

The paper ends as follows:

"... it seems to the writer that the data center provides the only sensible answer to the necessity of improving the accessibility of published data. The idea of a data center – either one or several – has been discussed recently on at least two occasions; namely the Commission Meeting of IAU Commission No. 45 at

> Prague, under the presidency of W.P. Bidelman, and the conference sponsored by the National Science Foundation, on the "Construction and Use of Star Catalogues" held in 1966 at the University of Maryland."
>
> (Jaschek 1968, p. 660)

Looking in turn at those two references, we see in the proceedings of the IAU Commission 45 meeting at the 13^{th} IAU GA (Prague, 1967) that

> "W.P. Bidelman spoke of the need for a general reference catalogue giving full bibliographic data for individual stars. About 10^6 stars would be involved, and the resources of a large institution such as NASA would certainly be required to provide such a centralized information service. Several members of the Commission expressed interest in, and support for, this proposal."
>
> (IAU Trans 1968, p. 220)

The NSF conference had its proceedings published in a special issue of the *Astronomical Journal* (Vol. **72/5**, June 1967, pp. 551-630). Although these contain a number of papers dealing with nomenclature, massive cataloguing, critical analysis, bibliographic issues, distribution, machine-readable compatibility, and so on, the recorded discussions fail to explicitly refer to the needs for data center facilities and activities, but these are definitely embedded "between the lines" and one could safely assume they were actually debated in informal talks between the attendees.

As a result of Perek's (1969) document, the IAU EC decided to set up an *ad hoc* working group (WG) and the following announcement was published in the IAU *Information Bulletin* dated June 1970, *i.e.* just before the 14^{th} IAU GA in Brighton:

> *Working Group on Numerical Data in Astronomy and Astrophysics*
>
> The Chairman of the Working Group, Professor Ch. Moore-Sitterly, wishes to make the following announcement:
>
> "The Executive Committee of the IAU has formed a Working Group to consider the problems of collecting and disseminating numerical data in astronomy and astrophysics. The membership of this Group is as follows:
>
> Mrs. Charlotte Moore-Sitterly, Chairman
> Prof. C.W. Allen[6]
> Prof. W. Fricke
> Prof. M. Migeotte
> Prof. E. Schatzman
>
> The Group must propose concrete steps to be taken in order to meet present and future demands for reliable numerical data in many specialized fields of astronomy and astrophysics.
>
> This task calls for the active co-operation of the Presidents of all Commissions to handle or require collection of numerical data. It is essential to have concise reports from specialists regarding:

[6]Acting as Secretary at the meetings during the 14^{th} IAU GA in Brighton.

– Existing information centers that are functioning well and operating on a continuing basis
– Information centers that are in the initial stage and should be encouraged to continue
– Specialized fields in which centers for numerical data should be established; and the data that are most utgently needed in each field.

Constructive suggestions for carrying out this mission on an Inter-Commission basis are solicited both before and during the Brighton Meeting."
(IAU IB 1970a, p. 14)

It should be precised that, at that stage, the working group was considered as temporary. This was going to change after the Brighton GA as its Resolution No. 7 stated that:

"Resolution No. 7

Proposed by the Working Group on Numerical Data
On the establishment of a Permanent Working Group on Numerical Data
The XIVth General Assembly of the International Astronomical Union resolves to establish a Permanent Working Group on Numerical Data."
(IAU IB 1970b, p. 5; IAU Trans 1971, p. 62)

More interestingly, a report of the WG meetings in Brighton was published (IAU Trans 1971, pp. 245-247). The opening general comments summarize well the discussions:

"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" (IAU Trans 1971, p. 245)

The following persons ("main data center leaders") were proposed as members of that first edition of the permanent WG on Numerical Data: G.A. Wilkins (Chairman), H.A. Abt, W.P. Bidelman, D.S. Evans, R.H. Garstang, R. Giacconi, B. Hauck, J.A. Hynek, C. Jaschek, J. Jung, T. Lederle, V.B. Nikonov, N.G. Roman, F.G. Smith, J.B. Sykes, H.M. Van Horn, and R. Wilson.

Historically very interesting, a snapshot of the data centers reported to the WG on 1 September 1970 was also provided as an appendix to the report with contact names and addresses:

"Data Centers Reported to Working Group 1 September 1970

– Atomic Energy Levels, W.C. Martin, Natl. Bur. Std., Washington, DC 20234, USA

– Cross Sections for Collisions of Electrons and Photons with Atoms, Ions and Small Molecules, L.J. Kieffer, Joint Institute for Laboratory Astrophysics, Boulder, CO 80302, USA

– Eclipsing Binaries, Photoelec. Obs. publ., continuing file of data, F.B. Wood, Univ. of Florida, Gainesville, FL 32601, USA

– Ephemerides, Planetary Data, Star Catalogues, G.A. Wilkins, Royal Greenwich Obs., Herstmonceux Castle, Hailsham, Sussex, UK – R.L. Duncombe, US Naval Obs., Washington, DC 20390, USA – Paris center

– Extragalactic Objects, J.D. Wray, Dearborn Obs., Evanston, IL 60201, USA

– Globular Clusters, Helen Sawyer-Hogg, David Dunlap Obs., Richmond Hill, Ontario, Canada

– Observatories, Instruments (Computer Listings) etc, A.G. Velghe, Obs. Royal de Belgique, Uccle-Brussels, Belgium

– Planetary Research Center, W.A. Baum, Lowell Obs., Flagstaff, AZ 86001, USA

– Pulsars-Center needed, Consult R. Giacconi, 11 Carleton St., Cambridge, MA 02142, USA

Star Catalogues, J. Jung, Stellar Data Center – Strasbourg
Radial Velocity Center – Marseille
T. Lederle, Astron. Rechen-Institut, Heidelberg, FRG
C.O.R. Jaschek, La Plata, Argentina
P.W. Hill, University Obs., St Andrews, Fife, UK
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 Astrophys. Obs., Victoria, BC, Canada

– Transition Probabilities, W.L. Wiese, Natl. Bur. Std., Washington, DC 20234, USA" (IAU Trans 1971, p. 247)

Several comments are in order here:

– this is the first appearance, in an IAU document dated 1970, of the Strasbourg Data Center that would officially exist only in 1972, and next to the name of Jung who was going to be its first Director;

– several of the centers mentioned are not object-oriented and therefore will have destinies more specific to IAU Commissions than to the developments mentioned hereafter;

– it is difficult to assess what was exactly the degree of advancement of the projects listed above; other ventures such as the *thinking* mentioned separately (IAU Trans 1971, bottom p. 245) of an ASP[7] group under the chairmanship of H.A. Abt on the " feasibility and desirability of establishing an Astronomical Data Center" was not very deep and never went anywhere (Abt 2005);
– the multiplicity of (hyper)specialized "data centers" would persist in spite of the creation of much larger and structured pan-astronomical organizations; the proceedings of the conferences *Astronomy from Large Databases* (Murtagh & Heck 1988, Heck & Murtagh 1992) record the presentation of quite a number of such specialized data collections in existence a couple of decades later.

A triennium after the Brighton IAU GA, WG Chairman Wilkins reported on the group (IAU Trans 1973, pp. 757-760), starting with a statement agreed with the IAU EC on its activities:

> "The activities and membership of the Working Group shall be determined by the Executive Committee of the Union.
>
> The principal aims of the Group shall be:
> (i) to collect and publish information about the existence and preparation of files of numerical data, especially those in machine-readable form, that are relevant to the interests of the Union; and
> (ii) to recommend ways by which the preparation of such data files and the retrieval of information from them may be carried out economically and effectively, and to offer advice on these matters to appropriate Commissions.
>
> In carrying out these activities, the Group shall endeavor to complement, and not to duplicate, the work of the Commissions of the Union in their specialised fields." (IAU Trans 1973, p. 757)

The group obviously was going to be the place to exchange information on astronomical data matters, including those on the centers themselves. As stated however in the reports of the IAU Commission 5 [Documentation] meetings at the 15^{th} IAU GA (IAU Trans 1974, pp. 73-74), the WG would be quickly attached to that Commission and renamed "WG on the Documentation, Exchange and Retrieval of Numerical data". Over time, it would go back to its shorter and much more handy label "Numerical Data".

Today it is still attached to IAU Commission 5 where this author chaired it after G.A. Wilkins (1970-1979), B. Hauck (1979-1984) and G. Westerhout (1984-1990). The WG Chairpersons are also the IAU representatives to CODATA where exchanges of information with colleagues of other scientific disciplines can take place.

The above chronology is summarized in Table 1.

[7]Astronomical Society of the Pacific.

TABLE 1. IAU chronology (until 1974) regarding astronomical data center projects worldwide.

1966	NSF conference on *The Construction and Use of Star Catalogues* (Univ. Maryland, 3-5 Oct 1966) (*Astron. J.* **72** (1967) 551-630)
1967	Prague IAU XIIIth GA – Commission 45 Meeting (IAU Trans 1968, p. 220)
1968	Jaschek's (1968) paper on *Information Problems in Astrophysics*
1969	IAU 32 Doc 11a on the urgency to coordinate actions on astronomical data (Perek 1969)
1970	14th IAU General Assembly (Brighton, 18-27 August 1970)
	Report of the preliminary WG on *Numerical Data for Astronomers and Astrophysicists* (IAU Trans 1971, pp. 245-248)
	Creation of a *permanent* IAU Working Group on *Numerical Data* (IAU Trans 1971, p. 62)
1973	Report of the permament WG on *Astronomical Data* (IAU Trans 1973, pp. 757-760)
1974	Report of IAU Commission 5 Meeting (24 Aug 1973) (IAU Trans 1974, pp. 73-74)

2. The Strasbourg Data Center

What was going on in France, and more particularly in Strasbourg, during all that time?

A few documents, including notes put together by P. Lacroute (1980), Director of the Observatory for the period 1946-1976[8], allow to get a good view of the progress towards the creation of a "Centre de Données Stellaires (CDS)" [Stellar Data Center][9].

The need for an organization able to collect and to disseminate stellar information was every day increasingly more urgent as data were piling up. Lacroute (1980) mentions A. Blaauw, R. Cayrel and J. Delhaye among the European astronomers pushing, in the late 1960s, for such a structure. Enquiries coming from abroad were circulated; surveys were carried out to review the issues (D.S. Evans on radial velocities; Ch. Moore-Sitterly on the collection of data carried out in Canada and USA; ...); it was appearing that

[8]For a general chronology of the Observatory history, see *e.g.* Heck (2005) in this volume.

[9]Renamed in the mid-1980s as "Centre de Données astronomiques de Strasbourg" to take into account it was, from then on, also dealing with non-stellar data.

many astronomers were interested in collecting information, but essentially only particular data or on specific type of stars.

The oldest trace we could find on the establishment of a stellar data center in Strasbourg goes back to the minutes of a meeting held in Strasbourg on 8 January 1969 with only six attendees from Paris and Strasbourg (Lévy, Delhaye, Lacroute, Jung, Artzner, Ratier). They discussed identification problems and which stellar data could be collected in astrometry as well as in other domains, calling in each case for the expertise of the most qualified astronomer.

As the idea of a data center was getting more precise, another meeting was organized in Strasbourg on 21-22 October 1969 in order to examine how in practice a data center could be made operational in Strasbourg with the best economy of means and the best efficiency:

> "Ce centre devrait pouvoir diffuser sous forme mécanographiquement exploitable, à tous les astronomes qui en feraient la demande, des données stellaires plus ou moins élaborées, regroupées par étoile. Ce centre devrait en outre signaler aux observateurs les lacunes les plus importantes dans les données existantes." (Lacroute 1969b)
>
> [That center should be able to disseminate, to all astronomers who would request it, machine-readable stellar data, more or less complex and star-oriented. That center should also point out, to the observers, the most important gaps in available data.]

The venture was becoming definitely international as the fifteen invited astronomers were coming from astronomical institutions in Geneva, Heidelberg, Marseilles, Paris and Strasbourg. Lacroute (1980) mentions that, around those times, J. Jung, *Astronome-Adjoint* at Paris Observatory and interested by the data center, was progressively installing himself in Strasbourg to devote his time to setting up the center.

In a letter dated 6 April 1970, Lacroute informed the IAU of the CDS project in Strasbourg and announced Jung as a speaker at the upcoming IAU GA in Brighton (August 1970 – cf previous section). Foreign institutions were then openly part of the venture:

> "A Strasbourg, nous envisageons d'organiser un Centre de Données Stellaires avec la coopération, notamment, de l'Observatoire de Heidelberg pour les positions méridiennes, de l'Observatoire de Lausanne pour la photométrie et de l'Observatoire de Marseille pour les vitesses radiales. Nous comptons que la mise au point du projet sera très avancée au moment du Congrès de Brighton." (Lacroute 1970a)
>
> [In Strasbourg, we are considering to set up a Stellar Data Center in cooperation with, among others, Heidelberg Observatory for the meridian positions, Lausanne Observatory for the photometry and Marseilles Observatory for the radial velocities. We reckon that the development of the project will be quite advanced at the time of the Brighton Conference.]

Another meeting was organized in Strasbourg on 4 July 1970 in order to review the status of the CDS project, to prepare the meetings at the upcoming IAU GA and to define priorities for the next steps of the work. The attendees were coming from the same institutions as the ones mentioned earlier, with the addition of Lausanne (Lacroute 1970b). The minutes of the meeting (Jung & Lacroute 1970) have a couple of interesting organizational comments:

> "Une structure définitive du Centre de Données et des tâches qui lui seront confiées ne pourra être décidée qu'après les discussions qui auront lieu à Brighton. Le Centre coordonnera en effet les activités d'Observatoires français et étrangers qui acceptent de participer à des travaux du type envisagé. Dès maintenant, une collaboration est établie entre les Observatoires de Lausanne (6 personnes), Marseille (1), Paris (3), Strasbourg (5); Heidelberg ayant donné son accord de principe. D'autres collaborations seront sollicitées."
>
> (Jung & Lacroute 1970)
>
> [A definitive structure for the Data Center and for its entrusted tasks will be decided only after the discussions that will take place in Brighton. The Center will coordinate the activities of French and foreign Observatories that will accept to take part in the activities of the considered profile. As for now, a collaboration has been established with the Observatories of Lausanne (6 persons), Marseilles (1), Paris (3), Strasbourg (5); Heidelberg has agreed in principle. Other collaborations will be sought for.]

After the IAU GA in Brighton, J.C. Pecker – who was involved in IAU Commission 5, but who was also the President *ad interim* of the *Comité National Français d'Astronomie (CNFA)* [French National Committee for Astronomy] – addressed a letter dated 19 October 1970 to the Director of the French *Institut National d'Astronomie et de Géophysique (INAG)* [10] [National Institute of Astronomy and Geophysics]. Pecker recalls the Brighton Resolution no. 7 as well as the favorable conditions for the CDS project, emphasizing the need to support it adequately. As it is again an excellent summary of the situation then, this letter is reproduced and its body translated hereafter:

19 Octobre 1970

Monsieur le Directeur de l'I.N.A.G.
Observatoire de Meudon
92 Meudon

Monsieur le Directeur,

L'Union Astronomique Internationale qui groupe les astronomes du monde entier a tenu cette année sa 14ème Assemblée Générale à Brighton, du 18 au 27 août. Dans la séance de clôture, parmi les 13 résolutions adoptées, je crois devoir vous signaler la résolution n° 7 par laquelle:

[10] Later renamed as *Institut National des Sciences de l'Univers (INSU)*.

"La 14ème Assemblée Générale de l'Union Astronomique Internationale décide d'établir un groupe de travail permanent sur le problème des données numériques."

Au cours du Congrès, les travaux d'un groupe d'étude ont montré clairement l'importance fondamentale qu'il y a, pour l'avancement des recherches en astronomie, à regrouper les données numériques dans les différents domaines de l'astronomie, à les comparer et à les rendre commodément utilisables par les procédés automatiques modernes. Cette tâche primordiale est du reste difficile.

En France, certains astronomes n'ont pas attendu la résolution de l'Union Astronomique Internationale pour orienter ainsi leur activité. Déjà un catalogue bibliographique est en cours d'achèvement à Paris. Par ailleurs, depuis un an, l'Observatoire de Strasbourg a pris l'initiative de grouper la collaboration d'un nombre d'observatoires français et étrangers pour établir, à Strasbourg, un Centre de Données stellaires en vue de l'étude de notre galaxie.

Le but important, mais bien défini, et la répartition du travail entre les collaborateurs les plus qualifiés font bien augurer de la réussite de cette entreprise commune entre Strasbourg, Heidelberg, Lausanne, Genève, Marseille et Paris.

Le groupe de Strasbourg est du reste largement représenté dans le groupe de travail permanent constitué par l'Union Astronomique Internationale.

J'attire respectueusement votre attention sur l'intérêt qu'il y aura à appuyer cette entreprise internationale où le rôle de la France est important, par l'affectation de postes ou de crédits au moment où le besoin se fera sentir.

Veuillez agréer, Monsieur le Directeur, l'expression de ma considération distinguée,

J.C. Pecker
Président (par intérim) du Comité
National Français d'Astronomie

[The International Astronomical Union, which gathers together the astronomers of the whole world, held this year its 14th General Assembly in Brighton, from 18 to 27 August. In the closing session, among the 13 general resolutions adopted, I believe I have to call your attention on Resolution No. 7 saying:

"The 14th General Assembly of the International Astronomical Union resolves to establish a Permanent Working Group on Numerical Data."

In the course of the conference, the investigations of a study group clearly showed the fundamental importance, for the advancement of research in astronomy, to gather together numerical data in the various fields of astronomy, to compare them and to make them easily usable by automatic modern processes. Such a prime task is moreover difficult.

In France, some astronomers did not wait for the resolution of the International Astronomical Union to initiate such activities. A bibliographic catalogue is being completed in Paris. On the other hand, since one year, Strasbourg Observatory took the lead in setting up a collaboration between some French and foreign astronomers to establish, in Strasbourg, a stellar Data Center in view of studying our galaxy.

The important goal, well defined, and the distribution of work among the most qualified collaborators augur well of the success of that undertaking common to Strasbourg, Heidelberg, Lausanne, Geneva, Marseilles, and Paris.

The Strasbourg Group is actually largely represented in the permanent working group organized by the International Astronomical Union.

I call respectfully your attention on the interest to support such an international endeavor where the rôle of France is important, be it by assigning positions or budget lines whenever this will be necessary.]

The next CDS meeting was held in Geneva on 27 November 1970 where the dozen of attendees reviewed as usual the degree of advancement of their work. Decisions were also made on an *Information Bulletin*: to be published in English with a circulation of 600 copies (soon after brought up to 700) directed at astronomical institutions as well as at interested individuals. The first issue (May 1971) presented the Center's activities, reported on the participating observatories (Marseilles, Lausanne-Geneva, Heidelberg, La Plata) and published a couple of papers listing catalogues recently published. A second issue appeared in December 1971.

Lacroute (1980) indicates that, from the end of 1970, CDS started *de facto* to operate under the directorship of J. Jung. As to the personnel, there was the active collaboration of the "participating observatories" already mentioned and, in Strasbourg, the contribution from some members of the Observatory personnel. Some funding was received as INAG subventions; some punching of catalogs was carried out on remaining fund from a local astrometric project, but most money was injected by Strasbourg Observatory. The work performed was described in the widely distributed *Information Bulletin* as well as in the proceedings of a few conferences.

Meanwhile negociations between the Directors of INAG (J. Delhaye, very much interested in the center) and of Strasbourg Observatory (Lacroute) were progressively shaping up the by-laws for the data center. It was to become an INAG structure ensuring the stability requested by its activity. It would be installed at Strasbourg Observatory, at least at the beginning. On 12 May 1971, the CDS project was presented at the *Conseil de Direction* of INAG where it was well received, with however the recommendation that the computations carried on an INAG computer in Paris-Meudon find a local solution such as the CNRS computer at Strasbourg-Cronenbourg. On 26 May 1971, INAG's Scientific Council in turn examined the project, but requested more information on the data, on the methodologies as well on the way the personnel would be hired and employed. It recommended also additional presentations at specialized groups, wished that an INAG representative be part of the CDS Council and recommended also a participation of the personnel to the same Council.

At the next CDS Meeting (Strasbourg, 25 November 1971), Jung (1971) informed the Council about all those administrative delays, expecting INAG to create officially the Center in December 1971 after a Memorandum of Understanding (MoU) be signed between INAG and Strasbourg Observa-

tory. This MoU was only approved by Strasbourg Observatory in its Council Meeting on 10 December 1971. The by-laws regulating CDS were approved at the beginning of 1972 and issued as INAG Decision 1/72/D0. Their first article specifies the aims and goals:

> L'INAG crée un Centre de Données Stellaires (CDS). Ce centre a pour buts, en vue d'études sur la Galaxie:
> 1. de rassembler les données les plus importantes sur les étoiles: positions, mouvements propres, magnitudes, spectres, parallaxes, etc.;
> 2. d'améliorer les données existantes grâce à leur confrontation;
> 3. de suggérer aux observateurs les observations les plus utiles pour compléter efficacement les informations disponibles;
> 4. de diffuser aussi largement que possible les résultats de ces travaux à la communauté astronomique;
> 5. d'effectuer des recherches sur la Galaxie à partir des données rassemblées.
>
> [INAG creates a Stellar Data Center (CDS). This center has the following goals, in view of studying the Galaxy:
> 1. to collect the most important stellar data: positions, proper motions, magnitudes, spectra, parallaxes, and so on;
> 2. to improve the existing data by comparing them;
> 3. to suggest to observers the most useful observations to efficiently complete the available information;
> 4. to disseminate as widely as possible the results of those works to the astronomical community;
> 5. to undertake investigations on the Galaxy from the gathered data.]

The by-laws were completed by INAG decision 2/72/DO nominating the first CDS Scientific Council made of six French and six foreign astronomers[11]: A. Bijaoui (Nice Obs.), A. Blaauw (European Southern Obs.), J. Boulon (Paris Obs.), G. Cayrel de Strobel (Meudon Obs.), J. Delhaye (Paris Obs.), Ch. Fehrenbach (Haute Provence Obs.), W. Fricke (Astron. Rechen-Inst. Heidelberg), B. Hauck (Lausanne Inst. Astron.), C. Jaschek (La Plata Obs.), J. Jung (Strasbourg Obs.), G. Larsson-Leander (Lund Obs.), and C.A. Murray (Royal Greenwich Obs.) for a term of three years starting on 1 May 1972.

Their mission is specified in Article 5 of the by-laws:

> "Le Conseil Scientifique:
> – propose à l'INAG le Directeur du CDS;
> – oriente les travaux du CDS;
> – examine les projets de budget du CDS;
> – examine, en vue de leur transmission à l'INAG ou à d'autres organismes, les demandes de moyens présentées par le CDS;
> – approuve les rapports annuels du CDS."

[11]See the list of the successive CDS Councils as an appendix to this volume (Bruneau & Heck 2005).

[The Scientific Council:
– proposes to INAG the CDS Director;
– orients the CDS activities;
– examine the CDS budget projects;
– examine, in view of transmitting them to INAG or to other organizations, the requests for means presented by the CDS;
– approves the CDS annual activity reports.]

And finally INAG Decision 3/72/D0 dated 31 May 1972 was installing J. Jung as the first CDS Director. CDS was then officially and totally in business. The inaugural Council meeting took place on 25-26 May 1972. The following excerpt of the meeting minutes is of interest here:

"J. Delhaye ouvre la séance en remerciant les membres d'avoir répondu à sa convocation, puis rappelle l'origine du projet de création d'un centre de données stellaires. Vieux projet, dont la paternité revient en partie à lui-même, mais aussi à A. Blaauw et à R. Cayrel, son exécution a été retardée pour des raisons administratives. Dans un souci de décentralisation, Strasbourg a finalement été choisi comme siège de ce CDS.
Raisons de ce choix:
– l'activité de P. Lacroute qui collaborait déjà avec W. Dieckvoss de Hambourg,
– compétences du personnel.
L'INAG, qui ne peut avoir de laboratoire propre, est l'agence qui définit la politique scientifique. Le CDS est une partie de l'Observatoire, mais a une ouverture internationale: aussi 50% des membres du Conseil Scientifique sont-ils des membres étrangers. Pour éviter d'en faire un centre uniquement rhénan, l'INAG a tenu à la participation de MM. Murray (Grande-Bretagne), Larsson-Leander (Suède) et Jaschek (Argentine)." (Jung 1972)

[J. Delhaye opens the session and thanks the [Council] members for having come to this meeting. He then recalls the origin of the project to set up a stellar data center. An old project indeed – the fatherhood of which is partly due to him, but also to A. Blaauw and R. Cayrel – the materialization of which has been delayed for administrative reasons. In a decentralization move, Strasbourg has finally been chosen as the CDS location.
Reasons for that choice:
– P. Lacroute's activity as he already collaborated with W. Dieckvoss from Hambourg,
– the personnel's competence.
INAG cannot have its own laboratories and is the agency that defines the scientific policies. CDS is part of [Strasbourg] Observatory, but has an international opening: therefore 50% of the CDS Scientific Council members are foreigners. To avoid making of CDS a Rhenish-only center, INAG wished the membership of Messrs. Murray (Great Britain), Larsson-Leander (Sweden) and Jaschek (Argentina).]

By the time of the CDS official existence, two issues of the *Information Bulletin* (May and December 1971) had already been published, with a

third one scheduled for July 1972. The *Bulletin* would be published at an average rate of two per year until it was discontinued after Issue 48 (March 1996).

The pre-CDS chronology is summarized in Table 2. See also Jung (2005).

3. CDS' Success Story

CDS' success story has already been commented elsewhere (Heck 2000, 2002). Over three decades now, CDS moved from a file holder to an impressive information hub. It is recognized world-wide for the excellence of its work and its products, something also acknowledged through the collaborations established with CDS by the other astronomical data centers created subsequently[12].

It is out of the scope of this paper devoted to the pre-CDS years to review in detail the history of CDS. Interested readers can find more on the subsequent evolution in the successive issues of the *CDS Information Bulletin*[13]. For a description of the current activities and services, please refer to the CDS web site[14]. CDS has been an evolving structure, taking advantage of new media and often pioneering their usage before they became popular world-wide.

From a historical stand, it is interesting to investigate why CDS did so well. Since I saw CDS taking shape in the office where I was working at Paris Observatory in 1970-71[15] and because of my subsequent position as a closely-bound scientific user and, for some time, as the 'international CDS salesman', here are a few axes from first-hand testimony.

First of all, it must be stressed that the context around the creation of CDS was very different of what we are experiencing today with all those Virtual Observatory projects. There was no big machinery around nor big funding available. The general feeling was largely indifference, if not perhaps here and there some hostility because the motivations were not clearly understood. Such resentments would come up again later on from time to time, qualifying for instance data centers as *astrogroceries*.

CDS basic idea was a genial one: creating a huge table of identification synonyms giving access to all individual data from the integrated catalogs,

[12]See, for instance, *CDS Information Bulletin* Issue **14** (January 1978) p. 119 for NASA's Astronomical Data Center, Issue **15** (July 1978) p. 93 for Japan's Astronomical Data Service at Kanazawa Institute of Technology, and p. 98 for the Astronomical Council of the USSR Academy of Science – just to mention the first ones chronologically.

[13]Available through the link `http://adsabs.harvard.edu/` of the *Astrophysics Data System (ADS)*, following `Browse Library` with `BICDS` as journal code.

[14]`http://cdsweb.u-strasbg.fr/CDS.html`

[15]J. Jung, then at Paris Observatory, was my PhD thesis supervisor.

TABLE 2. Chronology of steps leading to the creation of the Stellar Data Center (CDS), officially installed at Strasbourg Observatory in May 1972.

1969	Meeting on future CDS (Strasbourg, 8 Jan 1969) (Lacroute 1969a)
	IAU 32 Doc 11. on urgency to coordinate actions on astronomical data (Perek 1969)
	Meeting on future CDS (Strasbourg, 21-22 Oct 1969) (Lacroute 1969b)
1970	Letter from Lacroute to IAU announcing a report on CDS at the upcoming IAU GA in Brighton (Lacroute 1970a)
	Meeting on future CDS (Strasbourg, 4 Jul 1970) (Lacroute 1970b, Jung & Lacroute 1970)
	14th IAU General Assembly (Brighton, 18-27 Aug 1970)
	Letter from CNFA Chairman to INAG Director (Pecker 1970)
	CDS Meeting (Geneva, 27 Nov 1970) (Jung 1970)
1971	CDS Information Bulletin # 1 (Ed. Jung, May 1971)
	Meeting of INAG's *Conseil de Direction* (Paris, 12 May 1971) (Aubert & Charvin 1971)
	Meeting of INAG's Scientific Council (Paris, 26 May 1971) (Boulon 1971)
	CDS Meeting (Strasbourg, 25 Nov 1971) (Jung 1971)
	CDS Information Bulletin # 2 (Ed. Jung, December 1971)
	MoU project between INAG and Strasbourg Observatory on CDS approved by Observatory Council (10 Dec 1971)
1972	INAG Decision 1/72/D0 creating CDS
	INAG Decision 2/72/D0 nominating the first CDS Council
	Inaugural Council meeting (25-26 May 1972) (Jung 1972)
	INAG Decision 3/72/DO nominating J. Jung as first CDS Director (31 May 1972)

all of this being completed by an object-oriented bibliography linked to the database.

If CDS' success is certainly due to the clearsightedness of its founders and to the web of collaborations set up *ab initio*, additional explanations can easily be found: right decisions taken at the right times by its initial managers, consistency of policies followed and, last but not least, the small but dedicated staff on civil-servant positions. The home-made software was certainly also an excellent vector, once made portable (even if this conver-

sion was a very demanding exercise).

However, if most of the goals set by the founders have been reached[16], at least one of them did not really come through: astrophysical research directly geared to the center. This is worth stressing since such an ambition was explicitly written in the statutes. And this can probably be blamed onto the networks who allowed astronomers to stay at their home institutions rather than coming to CDS.

It is also probably correct and fair to say that, during its first years of existence, CDS was better perceived (or more successful) abroad than nationally. Things changed with the Hipparcos satellite, strongly supported by the French space agency CNES and with heavy French participation (see for instance Kovalevsky 2005). This consolidated for good the space involvment initiated with IUE and opened the way to a series of active collaborations with space and other large experiments.

In his 1973 report for the IAU WG on Numerical Data, Wilkins, among other interesting points, stressed the following ones:

> "The main factor that appears to influence the success, or otherwise, of a data centre is not its size, nor its hardware facilities, nor its location, but rather whether the persons responsible for maintaining the data files take an active interest in the generation and analysis of the data. When such an interest exists, any inadequacies in accuracy or content of the data will become apparent, and a continual improvement in the database and in retrieval facilities may be expected. The scope of a data centre should not be extended beyond the interests of the persons who are available at the centre, and the persons require both astronomical and data handling experience and knowledge."
>
> (IAU Trans 1973, p. 759)

A matter for meditation.

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