International Atomic Energy Agency

INDC(NDS)-27/G

INDC-373

INDC INTERNATIONAL NUCLEAR DATA COMMITTEE

T R A V E L R E P O R T

Second International CODATA Conference
St. Andrews, Scotland, 7-11 September 1970
and
Fifth Annual Meeting of CODATA
St. Andrews, 12 September 1970

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September 1970

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Summary

Since its foundation in 1966 CODATA has acquired a membership of 12 countries and 10 International Unions as well as a liaison with 8 international organisations. Union membership is so far restricted to the areas of physics, chemistry and biology, no environmental science is so far incorporated into CODATA up till now.

CODATA considers the IAEA as the only international liaison organization needed to represent the area of nuclear data. The achievements in international co-ordination and co-operation in the neutron data field are considered by CODATA as prototype examples for similar endeavours in other scientific data fields. A need for better world-wide co-ordination of compilation and evaluation activities in the field of non-neutron nuclear data is equally recognized by CODATA. In view of the current planning of the IAEA in this respect, e.g. a non-Neutron Nuclear Data Consultants Meeting in November 1970, CODATA was asked to avoid any duplicating initiative for the time being, and agreed to do so.

CODATA takes an active interest in the development of UNISIST but the relationship between CODATA and UNISIST is still not clearly established. The final UNISIST report will be published at the end of this year. Under the joint sponsorship of ICSU and UNESCO, an Intergovernmental Conference on Scientific Information is planned for October 1971. The US Committee on Scientific and Technical Information (COSATI) is planning a Meeting on Data Centre Operation for spring 1971. We recommend that the Agency's nuclear data and information activities be suitably represented at the UNISIST Conference and that consideration be given to the feasibility of NDS participation in the COSATI Meeting.

The contributions to the Second CODATA Conference demonstrated an increase in institutional, national and regional data activities, particularly in the use of computers in data compilation and publication since the First CODATA Conference. This time the areas of chemistry and thermodynamics data found the strongest emphasis. To our mind also this Conference showed still too many discipline-oriented contributions of a status report type and not enough interdisciplinary reports and exchanges of problems, experiences and methods.

The neutron nuclear data field was rather strongly represented by eight participants. One of us (J.J.Schmidt) gave an invited talk on "Aspects of critical evaluation of nuclear data information". In this talk, in order to emphasize the interdisciplinary character of CODATA, those problems and difficulties in data evaluation were particularly discussed that are also encountered in other than the neutron data fields.

The Fifth Annual CODATA Meeting demonstrated the following achievements of CODATA since 1966: first edition of an International Compendium of Numerical Data Projects (Springer Verlag, 1969), issue of four CODATA Newsletters and one CODATA Bulletin, organization of two International CODATA Conferences (1968, 1970) and co-sponsoring of a number of conferences and symposia in the field of data for science and technology, establishment of four task groups in various data fields. Possibly because of an imminent change in CODATA representation, the particularly important subjects: "Development of guidelines for existing and future CODATA task groups" and "Future activities of CODATA" found, in our view, unsatisfactory consideration. It is obvious that the US National Bureau of Standards, which was very strongly represented at the Conference (10 participants including its new director, Mr. Branscomb!), regards CODATA as a potentially important international endeavour and it is to be expected that it will take an increasing active interest in the development of CODATA.

Various progress reports were submitted to the meeting by the National and Union Members of CODATA and by Liaison Representatives from International Organisations; the IAEA was represented with a progress report on "Current activities of the IAEA Nuclear Data Section" by L. Hjärne and J.J. Schmidt, to which oral remarks on the present status of the Agency's INIS project were added.

1. Second International CODATA Conference, 7 - 11 September 1970, 7 - 11 September 1970, St. Andrews, Scotland (L.Hjärne, J.Schmidt)

1.1. Attendance

Countries

Belgium	3	Netherlands	1
Canada	3	Poland	4
France	13	South Africa	1
German Democratic Republic	3	Sweden	1
Federal Republic of Germany	13	UK	40
Israel	2	USA	31
Italy	1	USSR	5
Japan	3		

Regional Organisations

EURATOM	3

International Organisations

a. Scientific Unions

ICSU	1	(Int. Council of Scientific Unions)
IUGS	1	(Int. Union of Geological Sciences)
IGU	1	(Int. Geographical Union)
CODATA office	3	

b. UN family

IAEA	2
UNESCO	1
WHO	1

Total Attendance: 137

The high UK attendance was obviously due to the choice of the conference place. The strong USA attendance, particularly from the National Bureau of Standards (10), expresses the large variety of data programs currently pursued in the USA. Under the vigorous leadership of its new director Lewis M. Branscomb (formerly Joint Institute for Laboratory Astrophysics, University of Colorado, Boulder, Colorado) the National Bureau of Standards (NBS) appears to take an increasing interest in the development of CODATA. The comparatively low USSR participation is not believed to be representative for the actual data activities in the USSR.

Whereas the First CODATA Conference two years ago in Arnoldshain/Frankfurt showed a particularly strong attendence of spectroscopists, this Conference saw a predominant participation of chemistry, thermodynamics and computer specialists. The neutron nuclear data field was this time rather strongly represented by eight experts (FRG: 1, UK: 2, USA: 2, EURATOM: 1, IAEA: 2). A few data specialists from fields not belonging to CODATA (e.g. environmental sciences) were also present and gave various reviews of their activities.

1.2. Programme

Out of the formal programme, to our mind, the participants' interest centered around the following main topics:

(i) Progress of CODATA and relationship between CODATA and UNISIST

(ii) Importance of display units and computerised phototype setting for data centres

(iii) Demonstrations of remote data retrieval and computation

(iv) Material data banks for industrial use

(v) Data activities and critical evaluation in various scientific fields (thermodynamics, chemistry, nuclear physics, geology, biology and others)

Ad (i)

The progress of CODATA is dealt within section two of this report. At the moment no direct relationship exists between CODATA and UNISIST, since UNISIST is still in a developmental stage. The final report on the UNISIST feasibility study of a world scientific information system, jointly supported by UNESCO and ICSU, will be published at the end of this year. Under the joint sponsorship of ICSU and UNESCO, an Intergovernmental Conference on Scientific Information is planned for October 1971. It will be the particular purpose of this conference to draw attention to and gain acceptance of the recommendations of the mentioned UNISIST report by both governments and scientific communities. In this context it is worthwhile to mention that the US Committee on Scientific and Technical Information (COSATI) plans a Meeting on Data Centre Operation for spring 1971 which is not necessarily restricted to US participation.

We recommend that the Agency's nuclear data and information activities be suitably represented at the UNISIST Conference, and that consideration be given to the feasibility of NDS participation in the COSATI Meeting after programme details have become available (end of 1970).

In this connection it might be worth mentioning that a small informal session discussed the future relationship between CODATA and UNISIST. A couple of interesting items came up during this discussion.

1. The need for a change of the present dissemination of information through primary (archival) journals was expressed by some participants. They felt that these journals have generally not adjusted to the sharp increases of data volumes in Science and Technology in recent years. This problem has been recognized to a various degree in different disciplines and is particularly obvious in the nuclear data field.

2. The costs for information services are sharply increasing. Many fields have therefore changed from a cost-free to a charged service. Wide discrepancies in opinion were brought forward on the basis for such charges. Generally, the matter of such charges is subject to internal national policy decisions.

Ad (ii)

The usefulness of visual display units in nuclear data handling is well demonstrated by the SCORE System , developed jointly by Atomics International/USA and IBM for use on the IBM 360/50. In view of the presence of one of the inventors of this system, status and future applications of SCORE were discussed among the nuclear experts present. A particular impressive illustration of the applicability of display units in another field was given by a film which showed visual stereo-displays of complex molecular structures as occurring in the field of crystallography.

Present achievements and limitations in computerised phototype-setting were shown as used in the preparation of publications. The experts noted in particular a severe lack of software, but recognized generally the superiority of phototype setting over conventional reproduction of typed or computer print-out pages. This was said to be due to error reduction, better readability and saving of printing space. According to the experience of NBS, publications updated and issued at regular intervals are particularly well suited for phototype setting. In this context we recall that these were also the reasons which led the Agency to the systematic investigation of phototype production of the CINDA and INIS publications.

Ad (iv)

The contributions concerned with material data banks for industry dealt with the preparation of evaluated data for the aeronautical industry and with thermodynamic data on organic substances for the

petrochemical and chemical industries. A comprehensive report on the results of a feasibility study for a national materials data bank, sponsored by the Scientific Research Ministry of the Federal Republic of Germany and supported by strong industry interests, deserves particular mention. This data bank will also include physical, chemical, metallurgical and other properties of reactor materials. The large variety of materials and properties to be covered by this data bank necessitates a high decentralisation into satellite centres located in appropriate industry firms and feeding their data into the central data bank. They hope to extend the data bank finally beyond the national scale, but very difficult organisational problems will first have to be solved in its implementation within the FRG.

Ad (v)

One of us (J.J. Schmidt) gave an invited talk on "Aspects of critical evaluation of nuclear data information". In this talk the interdisciplinary character of CODATA was stressed by outlining those problems and difficulties encountered in the actual process of nuclear data evaluation which, to a high degree, are common also to other scientific disciplines. This was done to avoid addition to the number of mere discipline-oriented status reports which generally were only of value for the other experts of the field concerned. In view of the rather poor interdisciplinary exchange at the conference, this viewpoint was specially acknowledged by the participants.

Particularly from USSR side and from the CODATA Central Office the necessity of better co-ordination of compilation and evaluation activities in various fields of non-neutron nuclear data was stressed. The fields mentioned concern nuclear spectroscopy, non-neutron nuclear reactions and nuclear properties of isotopes. We informed the CODATA Central Office of similar demands to the Agency from US and EURATOM sides, of the pertinent recommendations of the INDC and of the non-neutron nuclear data Consultants Meeting planned by the Agency for the fall of this year. The CODATA Central Office was asked and agreed to avoid any duplicating initiative for the time being; it will be kept informed on the further development in this field.

2. Fifth Annual Meeting of CODATA
12 September 1970, St. Andrews, Scotland (J.Schmidt)

2.1. Agenda of the Annual Meeting

The following list contains only the main agenda items.

(i) CODATA budget 1969, 1970 and 1971
(ii) Status of the CODATA Central Office
(iii) CODATA publications
(iv) Reports of the Chairmen of CODATA Task Groups
(v) Possible new National and Union Members of CODATA
(vi) Liaison Representatives to CODATA
(vii) Progress reports from CODATA Members, Liaison Representatives and Observers
(viii) Conferences relating to data for science and technology
(ix) Future activities of CODATA
(x) Date and place of next Annual CODATA Meeting:
20 - 21 July 1971, Washington D.C., USA

2.2. CODATA Organisation, Membership and Liaisons

CODATA (= Committee on Data for Science and Technology) established in 1966 by the International Council of Scientific Unions (ICSU) is organized in a Committe, a Bureau and a Central Office. Current Committee Membership comprises representatives of 12 countries (Canada, Federal Republic of Germany, France, German Democratic Republic, Israel, Italy, Japan, Netherlands, Poland, UK, USA and USSR) and of 10 International Unions.

IAU = International Astronomical Union
IGU = " Geographical Union
IUBS= " Union of Biological Sciences
IUCr= " " Crystallography
IUGG= " " Geodesy and Geophysics
IUGS= " " Geological Sciences
IUPAB= " " Pure and Applied Biophysics
IUPAC= " " " " " Chemistry
IUPAP= " " " " " Physics
IUTAM= " " " Theoretical and Applied Mechanics

In addition CODATA maintains liaison with the following 8 international organisations:

FAGS = Federation of Astrophysical and Geophysical Services
FID = Fédération Internationale de Documentation
IAEA
ICSU-AB = ICSU Abstracting Board
OECD
UNESCO

WFEO = World Federation of Engineering Organisations
WMO

The German Democratic Republic, Israel and the Netherlands were approved as new national members of CODATA at this meeting. Sweden and Belgium will probably join CODATA as next countries. Interest in CODATA has also been shown by Australia, Hungary, India, South Africa and Switzerland which so far have minor data activities. Most member countries have established National Committees for CODATA. These serve as advisory bodies to their governments on data programmes and provide a mechanism for the co-ordination of data activities both within their countries and on the international level through CODATA.

So far the Union membership is restricted to the areas of physics, chemistry and biology; environmental sciences (meteorology, oceanography etc.) are still not included. It is still an open question whether environmental sciences will be incorporated into CODATA or, whether they will establish their own data committee parallel to CODATA. At the meeting the following organisations were proposed for CODATA membership:

BIPM = Bureau International des Poids et Mesures
IFAC = International Federation of Automatic Control
IMECO = International Measurement Confederation

So far no decision has been taken. EURATOM was also proposed but CODATA felt that liaison to the IAEA was sufficient to cover nuclear data.

The CODATA Bureau supervises the programme of the Committee and has the following membership:

Prof. F.D. Rossini (USA)	President
Sir Gordon Sutherland (UK)	Vice President
Prof. B. Vodar (France)	" "
Prof. W. Klemm (FRG)	Secretary-Treasurer
Prof. M. Kotari (Japan)	Member
Academician M.A.Styrikovich(USSR)	"
Dr. Ch.Schäfer (CODATA Central Office)	Ex-officio Member

The Committee meets once, the Bureau twice every year.

The Central Office is located at Frankfurt/FRG and is by now fully staffed with three scientists and two secretaries. Its current practical functions comprise e.g. work on the International Compendium, edition of CODATA Newsletters and Bulletins and preparation of CODATA conferences (see section 2.4.).

Observers were sent to the Annual Meeting by the Royal Swedish Academy of Sciences, the US National CODATA Committee, Poland, South Africa, and by the following authorities:

MINTECH = Ministry of Technology, UK
OSRD = Office of Standard Reference Data, Washington D.C., USA
OSTI = Office of Scientific and Technical Information, UK

2.3. Objectives of CODATA

To put the present achievements of CODATA in a proper perspective, we quote below its general objectives as laid down in its Constitution:

> "... to promote and encourage on a world-wide basis, the production and distribution of compendia and other forms of collections of critically selected numerical and other quantitatively expressed values of properties of substances of importance and interest to science and technology."

2.4. Achievements of CODATA

— International Compendium, CODATA Newsletter and Bulletin

CODATA was founded in 1966 by the International Council of Scientific Unions (ICSU).

Its main achievement since then is the publication of an "International Compendium of Numerical Data Projects" (Springer Verlag, 1969). Although still far from complete this compendium gives a first very useful world-wide survey and analysis of data centres and projects and their publications in various scientific disciplines including the area of nuclear data. It was criticised that, due to insufficient advertising, only 1100 out of 2500 printed volumes had been sold so far, although much greater interest in this compendium could be anticipated. Proposals were made regarding better advertising in particular to the industry and, through librarians, to the scientists. A new, more complete edition will be prepared containing in particular improved coverage of USSR data compilations and of data handbooks. The nuclear data parts of the first edition also need improvement and updating.

CODATA also issues a "CODATA Newsletter" twice a year and a "CODATA Bulletin" at irregular intervals; so far four Newsletters and one Bulletin have been published.

The question of a "CODATA Journal", an International Journal on Numerical Data for Science and Technology, was discussed at the Annual Meeting and at the Conference. It was the general feeling that such a journal would be much too general in nature

and probably not successful in view of the difficulties already encountered with more discipline-oriented data journals like the Nuclear Data and Atomic Data Journals. It was recommended instead that the CODATA Office should continue its Newsletter and Bulletin publications and concentrate all possible efforts on the improvement of the International Compendium.

— Task groups

A second achievement of CODATA is the setting-up of task groups in 1968 and 1969 on the following topics:

(i) Computer use

(ii) Fundamental constants

(iii) Key values for thermodynamics

(iv) Data for chemical kinetics

Written progress reports were submitted to the meeting by all four task groups. The task group on computer use organized a Symposium on Computer-based Techniques for Storing and Retrieving Numerical Scientific Data, held in Ottawa, Canada, in April 1970, and prepared the computer demonstrations given at the Second CODATA Conference. The task group will shortly consider proposals for a symposium in Europe in 1971.

The task group on fundamental constants is supposed to come forward with a new set of evaluated best values for basic physical and chemical constants in 1971. The latest available set prepared by Taglov, Parker and Zangenberg and published in Rev. Mod. Phys.41, 375, 1969 needs improvement by taking into account more recent precision measurements.

According to its first objective to prepare an internationally agreed set of values of the basic thermodynamic properties of a number of chemical species, the task group on key values for thermodynamics has developed a first set of tentative values for standard enthalpies and entropies. The ultimate aim, a true internationalization of chemical thermodynamics data, will probably not be achieved before 1975. To a better achievement of its objectives the task group wants an extention to a larger, more general group on thermodynamic properties without, however, specifying any guidelines for this larger task group.

The task group on data for chemical kinetics is working on a survey of pertinent compilation and evaluation activities in different countries.

Only one new task group was proposed for a survey on transport properties.

— Conferences

In addition to the two International CODATA Conferences at Arnoldsacin/Frankfurt in 1968 and at St. Andrews in 1970, and the Ottawa Computer Symposium mentioned before, CODATA has sponsored, partially through its national committees, the following conferences and symposia:

- National Conference on Methods for the Estimation of the Reliability of Data in Science and Technology, Moscow, February 1969.

- International Symposium on Numerical Reference Data, Polish Academy of Sciences, Warsaw, August 1969.

- International Conference on Precision Measurements and Fundamental Constants, National Bureau of Standards, Washington D.C., August 1970

2.5. Future activities of CODATA

With the exception of future improvements of the International Compendium this important item found completely unsatisfactory consideration. This is particularly true for the vital subject of CODATA task groups, of the development of criteria for their selection and of guidelines for their composition and work; the latter two subjects were almost entirely overlooked during the discussion. One possible reason for this may be that the representatives of CODATA are expected to change in the near future. It is hoped that this will make CODATA more effective. In order not to prejudice decisions at a later stage the deliberations and decisions on this subject were suppressed at this meeting.

2.6. Budget of CODATA

The total annual budget of CODATA has increased from about US $ 64.000 in 1969 to about 87.000 in 1970. A total budget of US $ 100.000 is foreseen for 1971. The budget is borne mainly by the CODATA Member States. The meeting proposed that the annual dues of the member states move to UNESCO scale beginning with the calendar year 1972 and a floor percentage of 0.6 %.

.7. Progress reports

Most of the National and Union Members and Liaison Representatives of CODATA submitted written progress reports. As IAEA Liaison Representative to CODATA one of us (J.J.Schmidt) submitted a written report on the current activities of the IAEA Nuclear Data Section and added a few oral remarks on the present status of the Agency's INIS project.