



14 CODATA / NEWSLETTER

JUNE 1975

TABLE OF CONTENTS
TABLE DES MATIERES

CODATA MEETINGS IN BRIEF BREF APERCU DES REUNIONS CODATA	2
FIFTH INTERNATIONAL CODATA CONFERENCE 5E CONFERENCE INTERNATIONALE CODATA	2
ANNUAL REPORT OF COGEODATA FOR 1974 RAPPORT ANNUEL DE COGEODATA POUR 1974	3
NEW PERIODICALS NOUVEAUX PERIODIQUES	5
THE ROLE OF HIGH-PRECISION PROPERTY DATA OF PURE COMPOUNDS IN INDUSTRIAL TECHNOLOGY LES DONNEES DE HAUTE PRECISION SE RAPPORTANT AUX SUBSTANCES PURES ET LEUR IMPORTANCE POUR LA TECHNOLOGIE INDUSTRIELLE	6
DATA PROGRAMMES IN INDIA LES PROGRAMMES DE COMPILATION DE DONNEES EN INDE	
THE STRASBOURG STELLAR DATA CENTER LE CENTRE DES DONNEES STELLAIRES DE STRASBOURG	7
LE CENTENAIRE DE LA CONVENTION DU METRE ET DU BUREAU INTERNATIONAL DES POIDS ET MESURES THE 100TH ANNIVERSARY OF THE CONVENTION OF THE METER AND OF THE INTERNATIONAL BUREAU OF WEIGHTS AND MEASURES	8
CANADA INSTITUTE FOR SCIENTIFIC AND TECHNICAL INFORMATION L'INSTITUT CANADIEN DE L'INFORMATION SCIENTIFIQUE ET TECHNIQUE	9
NEW PUBLICATIONS PUBLICATIONS RECENTES	10

*The Committee on Data for
Science and Technology
(CODATA) was established
in 1966 by the International
Council of Scientific Unions.*

*Working on an international,
interdisciplinary basis,
CODATA seeks to improve
the quality, reliability and
accessibility of data of
importance to science and
technology.*



Ad-hoc Working Group on Data for Industrial Needs held its first meeting on January 13-14 at the CODATA Secretariat. Attending were R.W. McIntyre, Chairman (U.K.), A. Bylicki (Poland), A. David (representing H. Viellard, France), M. Schönberg (FRG); Observers - B. Marx (France), J.R. Sutton (U.K.). Ex-officio - B. Dreyfus. MM. A.A. Bondi (U.S.) and H. Jancke (GDR) were unable to attend. Proposed Terms of Reference for the future Task Group on Data for Industry will be submitted to the next meeting of the Executive Committee

Advisory Panel on Data for the Biosciences met at the Royal Society in London on April 29. In attendance were Philip L. Altman, Chairman (IUBS), D.L. Duncan (IUNS), S.P. Lapage (National Collection of Type Cultures), V.B.D. Skerman (World Federation of Culture Collections), E.B. Worthington (International Biological Programme); Liaison Member - G.A. Wilkins (IAU and FAGS); Observers - A.S.V. Burgen (IUPHAR), M. Carapezza (IUCr), F. Chayes (U.S.A.), M. Menache (IUGG), G.L. Radford (U.K.), R.F. Tomlinson (IGU), H. van Olphen (National Academy of Sciences); Consultant - C. Schäfer (FRG); Ex-officio - P. Melchior, N. Kurti, P. Glaeser. MM. K. Egle (IUBS); H. Gutfreund (IUPAB and IUB) and K.P. Ivanov (U.S.S.R.) were unable to attend. Recommendations on the role CODATA should adopt in the biosciences included rewriting the "Guide for the Presentation of Biological Data in the Primary Literature", compiling a list of international biological data centers, and identifying physical property data in the biosciences.

Advisory Panel on Data for the Geosciences met at the Royal Society in London on April 28 under the chairmanship of G.A. Wilkins (IAU and FAGS). In attendance were M. Carapezza (IUCr), W.W. Hutchison (IUGS), P. Melchior (IUGG), M. Menache (IUGG), R.F. Tomlinson (IGU); Consultants - H. van Olphen (National Academy of Sciences). L. Perek, Consultant and Chairman ICSU Panel on World Data Centres was unable to attend. Observers were F. Chayes (U.S.A.), E.B. Worthington (U.K.), C. Schäfer (FRG); Secretary - P. Henning. Ex-officio - N. Kurti, P. Glaeser. The Panel included among its recommendations the editing of a "Guide for the Presentation of Observational Data" and an interdisciplinary study on methodology for handling location and time-dependent data as outlined in a detailed report from Dr. Tomlinson.

Task Group on Key Values for Thermodynamics met in Moscow as guests of the Soviet Academy of Sciences on April 21 - 25. In attendance were J.D. Cox, Chairman (U.K.), J. Drowart (Belgium), L.V. Gurvich (U.S.S.R.), L.G. Hepler (Canada), L.V. Medvedev (U.S.S.R.), J.B. Pedley (U.K.), D.D. Wagman (U.S.A.). MM. W.H. Evans and S. Sunner were unable to attend. Discussions of subsequent Tentative Sets of Key Values for Thermodynamics and future plans were among their endeavors.

Program Committee of the 5th International CODATA Conference held its first meeting in London on April 25 under the chairmanship of D.R. Lide, Jr. (U.S.A.). Attending were Drs. R. Donovick (U.S.A.), C.N.R. Rao (India), G.A. Wilkins (U.K.). Ex-officio - P. Glaeser. Dr. V.V. Sytchev was unable to attend.

ANNOUNCING THE
**fifth biennial
international
codata conference**

to be held
JUNE 28 - JULY 1, 1976

at
The University of Colorado
Boulder, Colorado, U.S.A.

At the invitation
of the National Academy of Sciences

Scope of the Conference

Methodology of data evaluation, including statistical techniques for data analysis.

Procedures for correlating, extrapolating, and estimating data.

Data needs for mathematical modelling, technological impact assessment, process design, education, and other applications.

Descriptions of existing or planned data collection and publication activities.

Machine techniques for storage, retrieval, and dissemination of numerical data.

Call for Papers

Users of data, as well as those involved in data compilation, data evaluation, and data handling are invited to submit papers on subjects within the scope of the Conference.

The title, together with a brief description of the contents of the paper should be submitted as soon as possible, but not later than November 1, 1975, to the Chairman of the Program Committee, Dr. David R. Lide, Jr., National Bureau of Standards, Washington, D.C. 20234, U.S.A.

Authors of papers will be notified before January 1, 1976, about the acceptance of their papers and will receive instructions on providing an abstract at that time.

National Committee for the CODATA Conference

Honorary Chairman: Prof. George Hammond, Foreign Secretary, National Academy of Sciences
Chairman: Dr. Richard Taschek
Secretary: Dr. H. van Olphen
Members: Dr. B.W. Birmingham, Dr. E.L. Brady, Dr. Lewis M. Branscomb, Dr. Lee G. Burchinal, Dr. Edward Creutz, Dr. Alan Shapley, Prof. Julian Sturtevant, and Prof. Edgar F. Westrum, Jr. (ex officio).

Local Organizing Committee, Boulder

Mr. Neil Olien, Mr. Ken Armstrong, Mr. Joe H. Allen.

Program Committee

Dr. D.R. Lide, Jr., Chairman (U.S.A.)
Dr. Richard Donovick (U.S.A.)
Dr. C.N.R. Rao (India)
Prof. V.V. Sytchev (U.S.S.R.)
Dr. G.A. Wilkins (U.K.).

FOR FURTHER INFORMATION WRITE:

CODATA Secretariat
51 Boulevard de Montmorency
75016 Paris, France

ANNUAL REPORT OF COGEODATA FOR 1974

Most of COGEODATA's activities during 1974 were focussed on the Biennial Meeting at which the Committee's objectives were re-defined and the organization restructured. Complementing these activities were participation by COGEODATA representative in various meetings, working group meetings, answering of many inquiries by the Secretary, planning for 1975 activities, and editing and publication of a report on field data systems.

BIENNIAL MEETING

The meeting took place at UNESCO headquarters, Paris, in conjunction with the meeting of the Commission for the Geological Map of the World, 2 - 5 April, 1974. It was attended by 15 members of COGEODATA and 6 observers.

OBJECTIVES

A major outcome of the meeting was a review of COGEODATA's objectives, which were initially developed in 1967. The rapid development of information technology combined with a realization of COGEODATA's potential significance, led the committee to reconsider its terms of reference. To help clarify the meaning of these objectives, several examples of possible activities are listed. The objectives are:

1. To evaluate methodology and techniques of modern information technology, including computers, to the management of geological data.

Examples of Possible Activities

1. Test and evaluate generalized data-base management systems; sponsor meetings; publish evaluation.
2. Appraise operational field data systems; sponsor meetings; publish evaluation.
3. Publish bibliographies and literature reviews.
2. To promote and foster the application of modern data-base management techniques by geological organizations.

Examples of Possible Activities

1. Compile worldwide summary of active projects.
2. Offer and provide practical advice, particularly to initiate projects.
3. Conduct cost/benefit studies of current projects.

4. Make presentations to appropriate IUGS commissions and committees.
3. To facilitate the exchange and dissemination of geological data in computer-processable form on a multilateral or global basis.

Examples of Possible Activities

1. Identify the need for data standards and develop those required.
2. Identify problems of exchanging data between different systems.
3. Study and report on availability of global telecommunication networks of interest to geologists.
4. Compile a directory of on-line and other information and data services currently available.
4. To provide advice and assistance to international organizations and activities with respect to the activities (1-3) listed above.

Examples of Possible Activities

1. Advise and assist implementation of information systems in developing countries.
2. Participate in major international projects such as IGCP. Cooperate with multi-disciplinary projects and organizations, e.g. CODATA.
3. Establish permanent secretariat.
4. Organize task forces of experts to solve particular problems.

ROLE OF COGEODATA

COGEODATA can either play a passive role in observing developments take place or it can become active and start guiding and initiating developments. It seemed to the Committee that COGEODATA must take the latter course of action and, accordingly, an appropriate plan was proposed.

WORKING GROUPS

The main effort in Paris was devoted to establishment of Working Groups, which involve many members. We plan to reduce the size of the Committee

by the next meeting at the 25th International Geological Congress in 1976.

Working Groups were established to deal with five main areas:

1. Data Capture and Presentation.
2. Data Management Systems.
3. International Aid.
4. Standards for Communication.
5. Public Information.

DATA CAPTURE AND PRESENTATION

These two topics have been singled out because on initial contact with computers, geologists commonly have difficulty in both areas - data capture (input), and presentation (output). Many geologists have found that there is a substantial energy barrier to be overcome before entering data into the computer so that they may be processed and compiled. It includes an enormous (and commonly unwarranted) amount of coding, bottlenecks in keypunching, problems in editing, and time required to learn some programming and to become familiar with at least one data management system. More fundamental has been the question of how much should be coded, how much should be free text, and what linkages should be used depending on anticipated use of the data. It is this final point that forms the link to presentation (output). In design of his input document a geologist would like to "mimic" what he has been doing but also, knowing what options he may have in presentation, plan so that he may take advantage of these.

Area meetings in Europe and North America are taking place this year (1974), and will be followed by a workshop proposed for 1975.

DATA MANAGEMENT SYSTEMS

Once data are collected, a file and/or data base management system is required as a vehicle. A "good" system relieves the user of a lot of unnecessary software development headaches but a system that is "good" in one situation is not necessarily "good" in another. Commonly a prime consideration is the computer and particularly the computer a geologist has access to. Another is cost - i.e. is the system already available or must it be purchased? The varied nature of geological data collected leads to some systems being more useful than others for a particular type of geological environment (metallic mineral deposits, oil and gas pools, high-grade metamorphism, quaternary deposits, terrain analysis and evaluation, etc.)

At the Paris meeting of November 1973, Data Management Systems were discussed and described because once data are collected, systems must be used to handle the data. Vice-versa, system designers must be aware of the problems and needs of the geologist. Results of this meeting are in press.

A study nearing completion is a "Guide to File System Characteristics" being compiled by Dr. J. Hruska in consultation with Mr. J.B. Chase. Following completion of the draft, a workshop is planned to allow a comparative analysis.

INTERNATIONAL AID

COGEODATA has an obligation to disseminate the expertise accumulated in the course of its co-operative studies. Unfortunately, anyone seriously interested in utilizing a particular system or technique cannot do so solely by reading the literature. Communication becomes much more effective through personal contact. In addition each new potential user has unique, fundamental constraints - type of geology, computer available, monetary budget, systems assistance available, etc., which immediately limit the opportunity to become quickly operational. Recognizing this, COGEODATA further recognizes that communication will be at two levels - for technologically advanced countries (where potential users can commonly fund their own way to a workshop and have already sufficient knowledge to appraise the problem) and technologically developing countries (where potential users would be uncertain of which system could be most appropriate and who would also have difficulty in obtaining funds to attend the necessary workshops). It is in the latter area we plan to gradually build up a series of regional contacts and in consultation with them plan a workshop for 1975 or possibly in conjunction with the I.G.C. in 1976.

Although it was felt at the meeting that swift progress should be made towards establishment of a secretariat, subsequent discussion led to the conclusion that this matter should wait until after the workshop in Australia in 1976.

STANDARDS FOR COMMUNICATION

Since its inception, COGEODATA has devoted much attention to the matter of "standards". COGEODATA and certain national bodies now accept certain minimum standards which will be particularly required for data transfer.

At this point in time, however, COGEODATA is examining how it can guide and foster proper utilization of computer-based techniques to advance the science of geology. This is being done keeping in mind the need for "standards". The time has come to identify what commonality there is among data bases, with their almost infinite number of variables, e.g., geochemical files. The first step is a questionnaire to initiate a pilot study of collating data from different files.

The Biennial Meeting served to stress that there is now a greater need than ever for COGEODATA not only in an academic, but also in a practical sense.

Working Groups

Data capture, Presentation, and Data Management Systems. The Chairman discussed in Hannover (F. R. G.) in October with representatives of the working group the tentative proposals for meetings in 1975. Themes were selected, a Chairman proposed, and London selected as possible venue.

International Aid. Tentative arrangements were made to sponsor a workshop in Australia in 1976.

Standards for Communication. The co-chairmen, Dr. H. de la Roche and Prof. T. Hugi participated in a meeting in Berlin at which Dr. F. Chayes proposed the formal establishment of an Igneous Rock Information System. A report with recommendations was prepared by Dr. de la Roche and may become a central topic in a meeting tentatively proposed for Nancy (France) in Spring 1975.

International Geological Correlation Program (IGCP)

A proposal submitted to COGEODATA by Dr. A. L. Clark (U. S. A.) on "Standards and Guidelines for application of Computer-Based Information Systems to the Study and Assessment of Global Mineral and Fuel Resources" was formally transmitted to IGCP via IUGS.

Participation in Meetings

Prof. G. Y. Craig represented COGEODATA at the CODATA 9th General Assembly in Yerevan, U. S. S. R. in June. Dr. H. de la Roche and Prof. T. Hugi represented COGEODATA at the IMA Working Group meeting on electronic data processing in petrology.

Dr. W. W. Hutchison, Chairman of COGEODATA, represented COGEODATA at the Conference on "Data Storage and Retrieval for Mapping, Map Production and Documentation Purposes" in Hannover (F. R. G.), October 1974 and at the I. A. M. G. Symposium on "Computers and Mineral Resources" in Syracuse (U. S. A.) October 1974.

Responding to Inquiries for Guidance

The Secretary has had as one of his responsibilities, responding to inquiries and providing guidance to additional sources of information. Letters have been received from many parts of the world, many from unexpected quarters. Replies from the Secretary have pointed the direction to existing expertise and past experience, which in turn has made more efficient the gradual acceptance and utilization of computer-based information systems throughout the world. COGEODATA is grateful to the Department of Energy, Mines and Resources (Canada), through the Canadian Centre for Geoscience Data for providing the secretarial, photocopying, and computer text-editing/photo-composition services required to administrate the Committee's affairs.

Some disappointment has been expressed that these services have not been expanded - a more vigorous effort at publicity and publication of a newsletter have been proposed. While highly desirable, an expansion of this sort would place unacceptable demands on the Canadian Centre for Geoscience Data, and establishment of a full-time permanent secretariat would be required before any major expansion of services could be contemplated.

Productivity

Recently COGEODATA published, through the Geological Survey of Canada, an updated bibliography, "Computer-based Storage and Retrieval of Geoscience Information: Bibliography 1970-72", compiled by C. F. Burk, Jr., Canadian Centre for Geoscience Data. This is a particularly useful publication which gives quick reference to published activities in computer data-base management in the Geosciences.

Currently being edited are "Recommendations on Preparation of Geological Files" (Dr. D. F. Davidson, U. S. A.) and the publication of the COGEODATA Seminar dealing with Geological Field Data Systems and Data Management Systems, which was hosted by UNESCO in November 1973. It is hoped both reports will be published this year.

Ottawa, Canada
6 December 1974

W. W. Hutchison

TWO NEW PERIODICALS

BNIST: BULLETIN D'INFORMATION is a new French quarterly publication, edited by the Bureau National d'Information Scientifique et Technique, and designed to report on the activities of the French government in the field of scientific and technical information. This first issue of the BNIST Bulletin describes the overall organization of the French National Information Network and gives the list of the 50-odd development contracts awarded to various research institutes and applied research agencies to help them set up data banks, data centres, referral services, etc., all of which will become components of the French Information Network. More details can be found in the BNIST Annual Report for 1974. The Bulletin d'Information du BNIST is available free of charge from: Bureau National de l'Information Scientifique et Technique, 97 rue de Grenelle, 75007 Paris.

La REVUE DES SOMMAIRES est un nouveau bulletin de signalisation qui reproduit chaque mois les tables des matières d'une centaine de revues françaises axées sur les sciences appliquées, les techniques industrielles et les innovations technologiques. On sait, depuis la création de Current Contents que la formule a fait ses preuves et qu'elle permet de rendre d'indéniables services à qui cherche à se tenir au courant. Lancée l'été dernier par le Centre de Promotion de la Presse Industrielle et Scientifique, groupement réunissant une trentaine d'éditeurs et d'associations professionnelles à vocation technique, la Revue des Sommaires comporte dans chacun de ses numéros, un index alphabétique des revues signalées et des cartes-réponses permettant au lecteur de commander soit le numéro entier d'une revue, soit la photocopie de l'article qui l'intéresse. La Revue des Sommaires est disponible au C. P. P. I. S. F., 6, rue du Faubourg Poissonnière, 75010 Paris.

THE ROLE OF HIGH-PRECISION PROPERTY DATA OF PURE COMPOUNDS
IN INDUSTRIAL TECHNOLOGY

A. A. Bondi,
Shell Development Company, Houston, Texas 77001

Highly reliable literature data on physical properties of pure compounds are important in but few areas of industrial technology. Some of them are obvious:

1. Where the pure compound is the final product or the intermediate, the published data serve as analytical or quality control reference points, or, in some instances, as the basis for billing*. This is particularly true of uniquely identifying properties, such as spectroscopic data. If one is really sure that one's product is "the one", literature data can supplement one's own measurements in customer service. In most of these cases, the cost of the in-house determination of these same properties is the only, generally minor, saved expense.

2. High-precision properties of pure compounds are only moderately useful in process design because of the crudity of the mixing rules with which the pure compound data are generally converted to the mixed-stream property data that are really needed. Even the extremely important relative volatility data for separation processes are only moderately sensitive to the precision of the pure compound input data, since they are often dominated by non-ideality corrections. Moreover, given their great leverage on plant costs, the final design data are generally determined experimentally if there is but the slightest doubt regarding the calculated literature-derived estimates.

3. Hence the value of high-precision property data lies often less in the intrinsic value of that precision than in the implicit reliability of a set of literature data, so that the engineer who refers to them can accept them without the expense of doubts and further checks and searches. The easy availability of such data in a well known source has a substantial economic value if one remembers that process design engineers are known to spend more than half of their very valuable time on the search for (reliable) property data. The examples by Zudkevitch of Exxon are well chosen to demonstrate the sensitivity of some important plant cost elements to uncertainty in property data. In the actual case the uncertainties for individual plant components interact with each other, and only their combined effect spells out the cost of an uncertainty in some crucial element. Hence, the cost effects of data uncertainties can be much larger or much smaller than Zudkevitch indicated. Frequently they are smothered by other design uncertainties.

4. One set of data falls outside this gloomy picture, the heat and the free energy change of chemical reactions, commonly derived from heat of combustion and spectroscopic data, respectively. Few industrial organizations need these data frequently enough to maintain the very high experimental skill level required for useful data generation. Hence, virtually

*In that case a publicly "certified" property datum is, of course, the basis for contractual obligations.

everyone relies on published data. Since the needed reaction enthalpies are small differences between large numbers, errors in excess of 0.1 percent in the basic numbers, generally heats of combustion, are quite intolerable. Many modern plants rely for their operability upon the clever combination of exothermic and endothermic reaction steps for capital and operating cost minimization. Here the accuracy and precision of the basic data can be spelled out in large dollar amounts, but will rarely be told because of the proprietary nature of the information. The accuracy and precision of the free energy data required for meaningful estimates of equilibrium product distribution is an order of magnitude greater than is that for reactor enthalpies alone. The need for more and for precise data and for their critical evaluation is therefore quite overwhelming.

5. In actuality there is less than 0.1 percent probability that reasonably reliable physical property data exist for all the substance under consideration in any given novel chemical synthesis process. Hence the most important function of "standard reference" data is their "extrapolatability" to other compounds. The reason for the needed high accuracy and precision is the dependence of the extrapolation to novel compounds upon the development of molecular structure increments. These are generally small differences between large numbers, which are then recombined, thus cumulating all the errors found along the way.

6. Thus a substantial portion of the economic impact of the Standard Reference Data is simply due to their availability as "unquestionably reliable" information. A presumably measurable part of this potential benefit is the reduction in engineers' and chemists' search time. In order to maximize this benefit, the potential user must not only know that the information exists, he must also be able to gain rapid access to the data of interest. To this end I suggest that reprints of J. Phys. Chem. Ref. Data* be advertised as packages aimed at specific user groups, such as a "process engineer's package", an "air conservation package", etc. Often they will be most useful as components of particular teaching and/or practitioner's packages, such as Xerox Corporation assembles for professors and others with large captive audiences (or clientele). Representatives of OSRD or of OSRD-output users should be encouraged to present such applications to specifically-targeted professional meetings.

Two kinds of economic benefit are identifiably associated with high precision, mutually consistent thermochemical data. One is the reduction in the uncertainty of chemical-reactor design through the reduction in the uncertainty of heat balancing, which becomes the more significant the larger and the more highly integrated the plants. The other is the prediction of process feasibility for thermochemical equilibria. Given the large number of exploratory

*And of appropriate CODATA output.

investigations per successful development, the ability to guess correctly whether an idea has any promise at all is increasingly valuable as the chemical world becomes increasingly competitive. A missed opportunity because of an incorrectly predicted positive free energy change can be even worse than the time wasted on fighting the second law in the opposite case. The past is not a good guide for measuring the economic significance of this point because of the in-

creasingly sophisticated syntheses required in a world in which most of the easy things have been done.

ACKNOWLEDGMENTS:

The writer is indebted to Dr. Ping Chueh for valuable suggestions regarding some of the data needs of practicing engineers.

THE STRASBOURG STELLAR DATA CENTER

In view of the growing needs of the astronomical community with regard to information, the INAG (Institut National d'Astronomie et de Géophysique) decided to create in 1971, the Stellar Data Center (Centre de Données Stellaires = CDS) at Strasbourg. The aim of this center is to promote the collection, updating, critical evaluation and distribution of data concerning stars. Data under consideration are positions, proper motions, radial velocities, spectral types, magnitudes, colors, stellar peculiarities, etc.

All information regarding these parameters is collected by various astronomers at a number of observatories collaborating with the CDS, namely Geneva, Lausanne, Heidelberg, Paris and Marseille. The information is then stored on tape and passed to Strasbourg which stores and distributes the information. The distribution is made on request through printouts, tapes, microfiches or telex, on a non-profit basis. The Center also has facilities to handle the information already stored, and is thus in a position to answer a number of queries on statistical problems of use for both new research and the preparation of observing programs.

Among the other services provided through the Center, there exists a bibliographic reference service which by examining the current literature, can provide the list of all articles containing information on a given star. Another important facility is the compilation, done at Strasbourg, of a cross-reference index of star designation, which permits retrieval of the different designations under which a star has been identified.

The CDS is headed by a Director, assisted by an International Scientific Council. The staff is composed of four astronomers and five technicians. The CDS publishes twice a year an Information Bulletin which reports on its activities and on the progress in the field.

The address of the CDS is:
Observatoire de Strasbourg
Centre de Données Stellaires
11, rue de l'Université
67000 Strasbourg, France
Telephone: (88) 35 43 00
Telex 89506 STARØBS

DATA PROGRAMMES IN INDIA

India has some activity in data collection, evaluation and dissemination, but much is yet to be done in this area. We shall briefly indicate the current activities in India.

The information and documentation centre of the CSIR (INSDOC) provides some library documentation service and is now prepared to take up some activities related to data dissemination. It is planned that all the publications of CODATA as well as various standard reference data tabulations will be kept at INSDOC so that workers can get the required materials from this organization. It is hoped that India will soon establish competent data dissemination centres.

Data requirements of academic, industrial, R&D and other organizations in the country will be assessed by the National Committee on CODATA set up by the Indian National Science Academy and a questionnaire is being prepared for this purpose. Based on the replies to the questionnaire, the requirements of computer storage of data will be examined. The Computer Society of India as well as the major computer centres are being contacted regarding computer storage of data.

In India there is already considerable accumulation of meteorological data and there are presently 25 million punched cards with 2×10^9 digits. The

meteorological department is now considering computerizing some of the data and is also preparing a catalogue of meteorological data holdings. The National Physical Laboratory in New Delhi has considerable amounts of ionospheric data.

The Bhabha Atomic Research Centre has a group dealing with nuclear data and this group is the liaison with the International centre in Vienna (IAEA). India is a member of the International Nuclear Data Committee. The Indian group makes a report annually to INDC, and the report is made available to various institutions in the country.

There are some data evaluation programmes in the country, the major effort being in the following areas: Thermodynamic properties of halogenated methanes (Indian Institute of Technology, Kanpur), Phase Transformations of Inorganic Substances (Indian Institute of Technology, Kanpur), Physical Properties of Alloys (Roorkee University), Point Defects in Alkali Halides (Solid State Physics laboratory, Delhi) and Magnetic Properties of Atomic Nuclei, etc. (Indian Institute of Technology, Kanpur). All these projects have been supported by the U.S. National Bureau of Standards. In view of the considerable talent available for data evaluation programmes in India, there exists a potential for wider productivity of such endeavors.

LE CENTENAIRE DE LA CONVENTION DU METRE
ET DU BUREAU INTERNATIONAL DES POIDS ET MESURES

P. Giacomo
Sous-directeur du
Bureau International des Poids et Mesures

Il y a cent ans, le 20 mai 1875, les plénipotentiaires de 17 gouvernements signaient à Paris le traité connu sous le nom de Convention du Mètre; les adhésions ultérieures ont porté le nombre des états signataires à 44 (au 1^{er} mai 1975). Le but de ce traité était d'assurer l'uniformité mondiale des mesures. Le Système Métrique avait déjà fait ses preuves. Il fallait encore mettre sur pied une organisation qui lui assure à la fois des bases saines et durables, une autorité mondialement reconnue, et, pour l'avenir, les extensions et les améliorations dont près de cent ans d'expérience avaient montré l'utilité.

La Convention du Mètre créait le Bureau International des Poids et Mesures (B.I.P.M.), laboratoire permanent chargé de conserver les étalons internationaux et de leur comparer les étalons nationaux. Cela implique de nombreuses études et mesures auxiliaires, par exemple de thermométrie pour déterminer la dilatabilité des étalons de longueur, ou de volume et de la masse volumique de l'air pour déterminer la poussée de l'air sur les étalons de masse. Le travail du BIPM s'est donc étendu dès sa fondation à toutes les déterminations métrologiques essentielles.

Le BIPM est placé sous l'autorité d'un Comité International des Poids et Mesures (C.I.P.M.) dont les membres sont élus par la Conférence Générale des Poids et Mesures (C.G.P.M.), réunion quadriennale des représentants des Etats membres de la Convention du Mètre. La C.G.P.M. prend toutes les décisions de portée internationale: financement et orientation des travaux du B.I.P.M., perfectionnement et diffusion du Système International d'Unités (SI). Ces décisions sont étudiées et préparées par le C.I.P.M., qui s'entoure des avis de plusieurs Comités Consultatifs. Le B.I.P.M. effectue les travaux de laboratoire correspondants en étroite coopération avec les laboratoires nationaux.

La Convention du Mètre fixe la mission fondamentale du B.I.P.M.: assurer l'uniformité des mesures dans le monde entier. Il en résulte quelques conséquences logiques mais non pour autant évidentes.

Sur le plan des principes, l'élaboration du SI permet de rattacher toutes les mesures à celles d'un petit nombre de grandeurs, pour lesquelles on fixe les unités dites unités de base de SI. Le choix de ces unités de base reste absolument arbitraire tant qu'on n'envisage pas les problèmes pratiques de réalisation et d'utilisation. Mais l'uniformité des mesures est un objectif exclusivement pratique. Le choix des unités de base doit se porter sur celles que l'on sait réaliser et utiliser avec la plus grande exactitude. Ce choix n'est donc jamais définitif; il peut être remis en question chaque fois qu'une méthode nouvelle permet d'améliorer l'exactitude des mesures dans un domaine

particulier. Les changements de définition des unités qui en résultent doivent constituer un progrès pour les utilisateurs les plus exigeants; ils ne doivent pas constituer une gêne pour les autres. Il suffit pour cela de changer la définition de l'unité sans en changer la grandeur: la précision de la définition s'accroît mais les définitions successives restent compatibles entre elles, compte tenu de leur précision de réalisation et d'utilisation. La longueur d'onde de la radiation orangée du krypton (1960) définit un Mètre dont la longueur ne diffère pas de façon significative de celles du Mètre international en platine iridié (1889), du Mètre des Archives (1799) ou d'un dix-millionième du quart de méridien terrestre (1793).

Il ne suffit pas d'une définition commune de l'unité pour assurer l'uniformité des mesures. La réalisation et l'utilisation de l'unité sont autant d'occasions d'introduire des erreurs multiples. Aussi, même lorsque les unités sont définies sans faire appel à un étalon matériel, comme c'est le cas pour l'ampère, les étalons matériels continuent à jouer un rôle essentiel: ils permettent de comparer les mesures des différents laboratoires. Ces comparaisons constituent le seul moyen objectif pour vérifier l'exactitude effectivement obtenue. On peut aussi évaluer cette exactitude en analysant les causes d'erreur connues. Les comparaisons permettent souvent de déceler des causes d'erreur insoupçonnées ou sous-estimées.

L'activité du B.I.P.M. résulte immédiatement de ce qui précède: comparaisons internationales et vérifications d'étalons au niveau de précision le plus élevé, étude et élimination des causes d'erreurs aléatoires ou systématiques, méthodes susceptibles d'améliorer l'exactitude des mesures, renouvellement des définitions des unités de base du SI.

Les constantes physiques ont toujours tenu une large place dans la définition, la réalisation et l'utilisation des unités - unités de base ou unités dérivées -. Elles constituent en quelque sorte des "points fixes" auxquels l'homme a de tout temps cherché à rattacher les mesures: le jour solaire, la masse volumique de l'eau ont joué ce rôle depuis la plus haute antiquité. Les longueurs d'onde et les fréquences caractéristiques des systèmes atomiques, les points fixes thermométriques, la masse volumique du mercure, l'accélération due à la pesanteur, la luminance du corps noir (à la température d'un point fixe thermométrique), la masse molaire de divers atomes ou molécules, le coefficient gyromagnétique du proton, la vitesse de la lumière, la charge de l'électron, etc. sont utilisés, les uns pour définir les unités de base, les autres pour réaliser la plupart des unités dérivées. Il n'y a guère que les mesures de masse qui ne fassent appel à de telles constantes que pour évaluer des termes correctifs. L'intérêt évident de ces constantes physiques

est qu'elles sont "reproductibles" partout et à tout moment. Il ne faut pas attribuer à cette "reproductibilité" une vertu magique: tout comme leur détermination, l'utilisation des constantes comporte les pièges communs à toutes les mesures physiques: impuretés, effets parasites, écarts entre le schéma de principe et la réalisation, etc. Cependant, si l'on sait déterminer avec exactitude la valeur d'une constante, elle peut jouer avec la même exactitude le rôle de référence métrologique: l'expérience même qui permet de déterminer la valeur de la constante peut servir, en sens inverse à mesurer les grandeurs qui interviennent dans cette détermination. C'est l'une des raisons pour lesquelles le B. I. P. M. a toujours consacré une part de son activité à la détermination des constantes physiques d'intérêt métrologique.

Le centenaire de la Convention du Mètre et du B. I. P. M. sera marqué par plusieurs manifestations, principalement en France. Au niveau diplomatique, réunion de la 15^e Conférence Générale des Poids et Mesures, dont les représentants seront reçus par les plus hautes

autorités du Gouvernement français. Sur le plan scientifique, 5^e Conférence sur les Masses Atomiques et Constantes Associées (AMCO 5), organisée par l'U. J. P. P. A., Colloque sur l'Electronique et la Mesure, organisé par la F. B. I. E., exposition sur la métrologie, organisée par le Palais de la Découverte et le Bureau National de Métrologie (B. N. M.), journées "portes ouvertes" dans les laboratoires du B. N. M., publication par le B. I. P. M. d'un ouvrage "Le Bureau International des Poids et Mesures, 1875-1975". Une médaille sera frappée par la Monnaie de Paris, un timbre postal commémoratif sera émis et un film sur la métrologie sera diffusé par les soins du Ministère des Affaires Etrangères français dans le cadre du magazine "Synthèse". De nombreux pays étrangers célébreront également ce centenaire par des manifestations du même genre.

Elle rappelleront peut-être au grand public et même à de nombreux scientifiques que la métrologie n'est ni philosophie, ni article de musée, mais bien une branche active de la science moderne.

CANADA INSTITUTE FOR SCIENTIFIC AND TECHNICAL INFORMATION

The two principal information transfer services of the National Research Council - the National Science Library and the Technical Information Service - were joined in collaborative partnership within the newly formed Canada Institute for Scientific and Technical Information (CISTI). The new Institute, located on the Montreal Road campus of NRC, occupies a 7-storey building which, after three years of construction, was officially opened on 16 October 1974.

With its wide range of resources and services, CISTI is a unique Canadian organization offering expertise, bibliographic assistance and the benefits of a variety of mechanized systems to meet the information needs of the scientific, technical and medical communities of the nation. The Institute serves as a major node in the evolving Canadian network of scientific and technical information services and links this network with similar foreign and national networks. While continuing the activities of the former National Science Library and the Technical Information Service, the Institute's main character lies in its innovative approach toward the management and dissemination of information.

The information systems available at CISTI include:

CAN/SDI (Canadian Selective Dissemination of Information), a current-awareness service designed to alert scientists and engineers to new developments in their specific domains of interest. This system is now serving 2000 subscribers.

CAN/OLE (Canadian On-Line Enquiry), a complement to CAN/SDI, based on an interconnected network of 15 centers across Canada (universities, industrial firms, government departments), each of these centers being equipped with a terminal. This system, which has been operational now for more than a year, allows specific references to published information in natural

sciences, engineering or technology to be available to the customer within a few seconds. A similar system for medicine (MEDLINE) is provided through 10 centers in cooperation with the U.S. National Library of Medicine.

CAN/TAP (Canadian Technical Awareness Program) is a service similar to CAN/SDI but aimed at catering to the needs of technologists. It provides "Technical Briefs" designed to call the attention of industry to new technological developments.

CAN/SRP (Canadian Subject Retrieval Program), a complementary service to CAN/TAP, provides technical briefs classified by industrial sector. It can also supply retrospective listings of selected technical information.

In addition to providing the above services, CISTI will continue to operate the Health Sciences Resource Center and MEDLINE services; the Information Exchange Center (IEC), which is an inventory of approximately 10 000 university research projects funded by the federal government; the Inventory of Pollution Relevant Research (IPRR) and the Canadian Index of Scientific Translations.

The new address is:

Canada Institute for Scientific and Technical Information
National Research Council of Canada
Montreal Road, Building M-55
Ottawa, Ontario K1A 0S2
Canada

General Inquiries: 993-1600
Automatic Answering Services (24 hours/day)
English: 993-2441
French: 993-2528

NEW PUBLICATIONS

ATOMIC AND MOLECULAR PROPERTIES

MOLECULAR STRUCTURES AND DIMENSIONS, Volume 5 of the series, *Bibliography 1972-73, Organic and Organometallic Crystal Structures*, was published recently by the International Union of Crystallography and the Cambridge Crystallographic Data Centre. The current volume contains information on approximately 2000 structures published during 1972-73. Entries are arranged in 86 chemical classes and cover organic compounds, complexes, organometals and organometalloids. There are three indexes: author, formula and transition metal. All are cumulative for the years 1935-1973 and give references to volumes 1-5. The cost of volume 5 was maintained on the same level as for volume 4, which means a price in Netherland guilders of Dfl. 55 (US \$22.00 or £8.50). Personal copies may be obtained at a reduced price in Netherland guilders of Dfl. 39 (US \$15.50 or £6.50). -- Volume 6, *Bibliography 1973-74, Organic and Organometallic Crystal Structures*, is now also available. This new volume covers the literature up until 1974 for the principal journals and contains references to over 2000 structure determinations. Entries are arranged in the same way as for Volume 5, i.e. in 86 chemical classes and cover organic compounds, complexes and organometallic compounds. The cumulative indexes, which go back to 1936, give references to a total of about 12 000 entries. The price of Volume 6 is Dfl. 70 (vs27) at current exchange rates. There is approximately a 30% reduction for personal copies. -- A new numeric data volume for the years 1966-69 is also in preparation to follow the A1 Volume on *Interatomic Distances 1960-65* published last year. -- *Molecular Structures and Dimensions* is available directly from Oosthoek, Scheltema & Holkema, Emmalaan 27, Postbus 13079, Utrecht, The Netherlands, and standing orders placed with them ensure the earliest possible dispatch of the new volumes on publication. Alternatively, orders may be placed with Polycrystal Book Service, P.O. Box 11567, Pittsburgh, Pennsylvania 15238, U.S.A. or with any bookseller. Orders can be placed for the earlier bibliographic volumes and for the numeric data volume A1 *Interatomic Distances 1960-65*.

EARTH SCIENCES

CARTOGRAPHIE AUTOMATIQUE DES MARAIS ET WADDENS A PARTIR DES DONNEES MULTISPECTRALES DIETS 1 (1974, 81 pp, Mémoire No. 26 du Laboratoire de géomorphologie de l'Ecole pratique des hautes études, 15 boulevard de la Mer, 35800 Dinard, France) par D.-J. David, J. Deries et F. Verger, est une description détaillée des procédures informatiques qui permettent de passer des données multispectrales fournies par le satellite écographique ERTS 1 à des cartes achevées concernant les marais et waddens du littoral atlantique français.

HANDBOOKS

ANNUAIRE DU BUREAU DES LONGITUDES POUR L'AN 1975 (1974, 884 pp, 140 F, Gauthier-Villars, Paris). Les rubriques de l'Annuaire du Bureau des Longitudes sont devenues si nombreuses qu'on a été obligé de les répartir sur un cycle de trois années consécutives. Mis à part la première partie de l'ouvrage, dont le contenu revient régulièrement chaque année (prédictions des marées, valeurs de la déclinaison magnétique en France, signaux horaires et fréquences étalons), les principaux sujets traités dans les sections "variables" de l'Annuaire portent cette année sur: l'environnement terrestre (météorologie; haute atmosphère; basse atmosphère; vent solaire et magnétosphère; relations Soleil-Terre); les systèmes d'étoiles (constellations; dénombrement; mouvements propres et vitesses radiales; parallaxes et distances; classifications stellaires; galaxies); les propriétés des solides et des fluides (chaleur spécifique; densités et masses volumiques; changements d'état; capillarité et viscosité; résistance des matériaux); la démographie en France (structure de la population; mouvement naturel). Caractéristique absolument exceptionnelle pour un ouvrage édité en France, l'Annuaire se termine par un index alphabétique de 78 pages, qui couvre l'ensemble des rubriques traitées au cours des trois dernières années.

CONNAISSANCE DES TEMPS POUR 1976 (1975, 686 pp, 280 F, Gauthier-Villars, Paris) est le célèbre recueil des éphémérides astronomiques calculées par le Bureau des Longitudes. On y trouve, entre autres rubriques, une présentation détaillée du système de constantes astronomiques servant au calcul des éphémérides; les éphémérides du Soleil, de la Lune et des planètes (y compris Cérès, Vesta, Junon et Pallas); les positions moyennes pour 1976 de toutes les étoiles du catalogue FK4 et de son supplément; les éléments des éclipses de Soleil (23 avril 1976, annulaire; 23 octobre 1976, totale) et de Lune (13 mai et 6/7 novembre 1976); les éléments des satellites de Jupiter et leurs configurations mensuelles; les coordonnées géographiques de 277 observatoires astronomiques et de 25 observatoires radio-astronomiques, etc. Connaissance des Temps, qui n'a jamais connu d'interruption depuis sa fondation en 1679 en est cette année à sa 298ème édition.

ENVIRONMENTAL SOURCES AND EMISSIONS HANDBOOK 1975 (1975, 521 pp, \$36.00, Noyes Data Corporation), by Marshall Sittig, surveys several hundred sources of air and water pollution and traces back the various modifications that a given pollutant can take in the course of its transfers from the atmosphere into an aqueous stream or vice-versa. More than 200 subject entries are listed alphabetically, accompanied by 382 tables with figures and graphs.

MECHANICAL AND ENGINEERING DATA

MANUEL DE DONNEES TECHNOLOGIQUES D'USINAGE EN TOURNAGE (1973, 153 pp, 32 F, Centre Technique des Industries Mécaniques) a rassemblé sous forme de tableaux les valeurs optimales des conditions d'usinage (profondeur de passe, largeur de passe, vitesse de coupe, angle de coupe, angle de dépouille, rayon de bec) pour toute une série de matériaux à usiner et de matériaux d'outils. Des tableaux annexes rappellent d'autre part les caractéristiques des aciers au molybdène et/ou au tungstène, celle des céramiques et des cermets, ainsi que la forme normalisée des outils de tour et enfin la correspondance entre les différentes échelles de dureté (Brinell, Vickers, Rockwell) et la résistance à la rupture. L'ouvrage est disponible au CETIM, 52 avenue Félix Louat, 60304 Senlis, France.

NUCLEAR PROPERTIES

NEUTRON STANDARD REFERENCE DATA (1974, 371 pp, IAEA, \$20.00) embodies the Proceedings of an IAEA Panel held in Vienna in November 1972, and includes some recent information, both experimental and theoretical, on some of the most-widely used neutron standards: the cross-section of the light element reactions ${}^6\text{Li}(n,\alpha)\text{T}$ and ${}^{10}\text{B}(n,\alpha){}^7\text{Li}$; the cross-section of ${}^{197}\text{Au}$ for fast-neutron capture; the fission cross-section of ${}^{235}\text{U}$; the number of prompt neutrons emitted per spontaneous fission of ${}^{252}\text{Cf}$; and the prompt fission neutron spectra of ${}^{252}\text{Cf}$ and ${}^{235}\text{U}$. The book is made up of 37 papers in English and one in Russian.

THERMODYNAMIC PROPERTIES

GEOTHERMAL ENERGY 1975 (1975, 336 pp, \$24.00, Noyes Data Corporation), by Edward R. Berman, describes in detail the nature of the geothermal resources, their extent and the currently-available technology by which these natural sources of energy can be exploited. A World survey is given of the major geothermal installations (including those in the continental U.S. and Hawaii, Japan, New Zealand, Iceland and Italy, the USSR geothermal power stations being described in a separate chapter). Various systems for fracturing hot rocks, extracting heat with nuclear hot brine, and avoiding cave-ins through water reinjection are described.

THERMAL CONDUCTIVITY OF THE ELEMENTS: A COMPREHENSIVE REVIEW (1975, 796 pp, Supplement 1 to Volume 3 of *J. Phys. Chem. Ref. Data.* - Also available from the American Chemical Society, \$60.00*), by C.Y. Ho, R.W. Powell and P.E. Liley, presents and discusses the available data and information on the thermal conductivity of the elements and contains the recommended reference values resulting from critical evaluation, analysis and synthesis of the available data and information. It also gives estimated values, at least for normal temperature, for all those elements for which no thermal conductivity

information is available. Experimental thermal conductivity data are available in the world literature for 82 elements and estimated values exist for four other elements. Estimated values for the remaining 19 elements are given here, although only rough estimates are given for the transplutonium elements. Thus, this work provides recommended or estimated thermal conductivity values for all the 105 elements, in addition to presenting the original data, specimen characterization, and measurement information for the 5200 sets of raw data compiled. It contains a detailed discussion for every element, reviewing the individual pieces of available data together with the considerations involved in arriving at the final assessment and recommendations, and with the theoretical guidelines or semiempirical correlations on which the critical evaluation, analysis, and synthesis are based. It also includes the complete bibliographic citations for the 1658 references.

* A soft-cover edition is available at \$25.00 for members of the ACS or AIP (\$55.00 for non-members).

VIRIAL COEFFICIENTS FOR GASEOUS HYDROCARBONS

(1974, 42 pp, CSIRO, Melbourne, Australia) by A. Pompe and T.H. Spurling, is a compilation of 2nd, 3rd and, in some cases, 4th virial coefficients of some 47 gaseous hydrocarbons. The authors re-analyzed experimental p-V-T data, using a best-fit procedure to determine the polynomials, whose coefficients were then averaged to yield the virial coefficients required for establishing the virial equation of state for real gases.

MISCELLANEOUS

CLASSIFICATION DECIMALE DE DEWEY (1974, 2 volumes de 1426 pp et 1559 pp, 200 F, Cercle de la Librairie, 117 Boulevard Saint-Germain, 75006 Paris). Traduction française dans sa version intégrale de la 18^e édition américaine de la fameuse DDC, la Classification Décimale de Dewey est le fruit d'une collaboration de plusieurs années entre un groupe de bibliothécaires lyonnais et une équipe de bibliothécaires québécois. Plus simple que la CDU puisqu'entièrement composée de chiffres, la Classification Décimale de Dewey possède une souplesse d'utilisation qui permet d'adapter la profondeur de l'indexation à l'importance du sujet analysé et également au niveau du public de la bibliothèque concernée. L'ouvrage se présente en deux volumes: le Volume 1 réunit l'Introduction, qui est un mode d'emploi détaillé de la Classification, et les Tables Générales, qui fournissent les indices de bases correspondant aux divers sujets à indexer. Un indice de base se compose de 3 chiffres (au minimum) suivis d'un point décimal, le sujet pouvant être subdivisé au-delà de ce point. Le Volume 2 réunit les Tables auxiliaires, grâce auxquelles on peut soit compléter soit subdiviser les indices de base fournis par les Tables générales, et l'Index qui couvre à lui seul près de 1200 pages et constitue un outil de travail irremplaçable pour aider le classificateur à s'orienter.

CODATA PUBLICATIONS

International Compendium of Numerical Data Projects
Springer-Verlag, Berlin, Heidelberg, New York, 1969, 295 pp, DM 48.—, US \$20.—, FF 120.—

The "CODATA Compendium" provides a comprehensive world-wide survey and analysis of the organisation, coverage, services and publications of the existing data analysis centres in the physical and chemical sciences. In addition to its usefulness as a directory, the book provides a "key" or index to the substance-property content of the published data compilations. A descriptive brochure is available on request.

Proceedings : Third International CODATA Conference; Le Creusot, France, 26—30 June, 1972
CODATA, Frankfurt Main, F.R.G., Aug. 1973, 100 pp, 297 × 210 mm, DM 30.—, US \$15.—, FF 75.—.

CODATA Newsletter

No. 1 (Oct. 1968), 12 pp; No. 2 (Aug. 1969), 12 pp; No. 3 (Dec. 1969), 8 pp; No. 4 (May 1970), 16 pp; No. 5 (Dec. 1970), 28 pp; No. 6 (June 1971), 20 pp; No. 7 (Dec. 1971), 20 pp; No. 8 (May 1972), 16 pp; No. 9 (Dec. 1972), 12 pp; No. 10 (June 1973), 12 pp; No. 11 (March 1974), 20 pp; No. 12 (Aug. 1974), 24 pp; No. 13 (Sept. 1974), 20 pp; No. 14 (June 1975), 12 pp.

CODATA Bulletin : Annual subscription : US \$ 20 or 100 French Francs

- No. 1 (Oct. 1969), 12 pp, *Automated Information Handling in Data Centers*, US \$ 1.50
(Report of the CODATA Task Group on Computer Use, June 1969), superseded by Bulletin No. 4.
- No. 2 (Nov. 1970), 6 pp, *Tentative Set of Key Values for Thermodynamics - Part I*, US \$ 1.50
(Report of the CODATA Task Group on Key Values for Thermodynamics, Oct. 1970), superseded by Bulletin No. 5.
- No. 3 (Dec. 1971), 28 pp, *A Catalog of Compilation and Data Evaluation Activities in Chemical Kinetics, Photochemistry and Radiation Chemistry*
(Report of the CODATA Task Group on Data for Chemical Kinetics, Sept. 1971).
- No. 4 (Dec. 1971), 12 pp, *Automated Information Handling in Data Centers*, US \$ 1.50
2nd Edition (Report of the CODATA Task Group on Computer Use, Nov. 1971).
- No. 5 (Dec. 1971), 6 pp, *Final Set of Key Values for Thermodynamics - Part I*, US \$ 1.50
(Report of the CODATA Task Group on Key Values for Thermodynamics, Nov. 1971), superseded by Bulletin No. 10.
- No. 6 (Dec. 1971), 8 pp, *Tentative Set of Key Values for Thermodynamics - Part II*, US \$ 1.50
(Report of the CODATA Task Group on Key Values for Thermodynamics, Nov. 1971), superseded by Bulletin No. 10.
- No. 7 (Aug. 1972) 4 pp, *Tentative Set of Key Values for Thermodynamics - Part III*, US \$ 1.50
(Report of the CODATA Task Group on Key Values for Thermodynamics, June 1972), superseded by Bulletin No. 10.
- No. 8 (Dec. 1972), 32 pp, *Geological Data Files: Survey of International Activity*, US \$ 3,50
(Report of COGEOLOGATA, Committee on Storage, Automatic Processing and Retrieval of Geological Data of the International Union of Geological Sciences (IUGS).
- No. 9 (Dec. 1973), 6 pp, *Guide for the Presentation in the Primary Literature of Numerical Data Derived from Experiments*, US \$ 1.50
(Report of the CODATA Task Group on Publication of Data in the Primary Literature, Sept. 1973).
- No. 10 (Dec. 1973), 12 pp, *CODATA Recommended Key Values for Thermodynamics, 1973*, US \$ 1.50
(Report of the CODATA Task Group on Key Values for Thermodynamics, Nov. 1973).
- No. 11 (Dec. 1973), 8 pp, *Recommended Consistent Values of the Fundamental Physical Constants, 1973*
(Report of the CODATA Task Group on Fundamental Constants, August 1973).
- No. 12 (Sept. 1974), 12 pp, *Energy Data Accessing and/or Retrieval*, US \$ 1.50
(Report on Data Tagging, compiled by a Panel of Experts at the Energy R&D Data Workshop held at Gaithersburg, Md., May 6-7, 1974).
- No. 13 (Dec. 74), 8 pp, *The Presentation of Chemical Kinetics Data in the Primary Literature*, US \$ 1.50
(Report of the CODATA Task Group on Data for Chemical Kinetics)
- No. 14 (Feb. 1975), 180 pp, *Proceedings of the Fourth International CODATA Conference on the Generation, Compilation, Evaluation and Dissemination of Data for Science and Technology* (Tsakhcadzor, U.S.S.R., June 1974), US \$ 17.00.

CODATA Secretariat
51 Boulevard de Montmorency
75016 Paris, France
TEL. : 525.04.96 - TELEX : 63553 F ICSU
Editor : Bertrand Dreyfus, Executive Secretary
Associate Editors : David R. Lide, Jr. and Edgar F. Westrum, Jr.