INTERNATIONAL COUNCIL OF SCIENTIFIC UNIONS
COMMITTEE ON DATA FOR SCIENCE AND TECHNOLOGY

CODATA 2 NEWSLETTER

AUGUST 1969

CODATA MEETINGS

The 7th Meeting of the Bureau of CODATA was held at the CODATA Central Office in Frankfurt/Main, Germany, on 27/28 January, 1969. The Bureau agreed unanimously that a Task Group on Data for Chemical Kinetics should be established by CODATA, and formulated the procedure for its formation and subsequent action (page 9).

At the invitation of the Consiglio Nationale delle Ricerche (National Research Council) of Italy, CODATA held its 4th Annual Meeting in Rome on 26/27 June, 1969. In addition to the eight National Members (Canada, France, Germany-FRG, Japan, Poland, U.K., U.S.A., and U.S.S.R.) and nine Union Members (IAU, IUBS, IUCr, IUGG, IUGS, IUPAB, IUPAC, IUPAP, and IUTAM), the Meeting was attended by liaison representatives from FAGS, FID, IAB, IAEA, UNESCO and WFEO (page 7), and observers from OSRD and OSTI (page 10), the funding agencies for the U.S. and U. K. national data programmes.

The items discussed at the Annual Meeting included the CODATA *International Compendium of Numerical Data Projects,* a new CODATA publication, the CODATA *Bulletin* (page 5), the 2nd International CODATA Conference (page 9), and future developments in the programme and organization of CODATA. The Members of CODATA gave unanimous approval to the admission of Poland to membership on CODATA (page 5), and to the sponsorship by CODATA of an international conference planned by the U.S. National Bureau of Standards (page 10).

The 8th CODATA Bureau Meeting was also held in Rome from 25 to 27 June, 1969.

CODATA CENTRAL OFFICE

The CODATA Central Office has a **new telephone number** as follows:

(0611) 74 80 44

THE INTERNATIONAL COMPENDIUM OF NUMERICAL DATA PROJECTS

With the publication of the first *International Compendium of Numerical Data Projects,* a milestone has been reached in the progress of CODATA. The production of this world-wide survey and analysis of data centres and projects, and their publications, represents the partial fulfilment of the first task assigned to CODATA in its Constitution: „To ascertain on a world-wide basis through the appropriate Unions and national bodies (i) what work on critical compilation of evaluated numerical data is being carried on in each country; (ii) what work is being sponsored by each Scientific Union or by other international groups; and (iii) what the needs of science and industry are for additional compilations of evaluated data". With this Compendium available to the scientific and technical community of the world, CODATA can now proceed more expeditiously on the other tasks that have been assigned to it.

The Introduction to the *International Compendium of Numerical Data Projects,* reproduced in full below, gives the potential buyer and user of the Compendium an insight into the rationale behind its production. Details of the „Table of Contents", which follow, indicate the comprehensive scope and coverage of the CODATA Compendium.

The International Compendium of Numerical Data Projects (295+ XXIII pages) is published by Springer-Verlag, Berlin, Heidelberg, New York (Title Number 1611), and will be available from the retailer in September, 1969, at a price of DM 48,--: US $ 12.00.

INTRODUCTION

This International Compendium of Numerical Data Projects is a key part of the program of the Committee on Data for Science and Technology (CODATA) of the International Council of Scientific Unions. The general purpose of CODATA is to promote and encourage on a world-wide basis, the production and distribution of collections of critically selected numerical and other quantitatively expressed values of properties of substances, and systems of substances, of importance to science and technology. As a start toward the attainment of this goal the present Compendium has been assembled from the results of questionnaires submitted to National and Union Members of CODATA and other key people throughout the world. Of particular value has been *Continuing Numerical Data Projects, A Survey and Analysis* prepared in the Office of Critical Tables of the U.S.A. National Academy of Sciences.

The term „numerical data of science and technology" if taken in its broadest sense would include an enormous amount and variety of quantitative information. CODATA recognizes this fact, and believes that the initial step in its task must be restricted in the main to consideration of critically evaluated quantitative data for pure substances and simple, characterized systems of pure substances. Such data constitute the building blocks on which depend properties of more complex systems.

The material in the Compendium attempts to answer the following general questions: what compilations containing critically evaluated data are now available; what centers or organizations produce or aid production of such data for publication on a continuing basis; what national programs exist for financial support and encouragement of data compilation work; and what guidelines are available to compilers of all countries so that their products may be compatible. Information about centers will be restricted to those centers that regularly publish data compilations, or have well advanced programs for publishing such compilations, or have a supporting role for compilers such as the preparation of bibliographies of papers that contain numerical data. Centers that may have files of data, but only answer questions on request are not included. Publications otherwise suitable but not generally available are also excluded.

The primary emphasis is on projects that systematically extract, evaluate, and publish data for selected fields on a continuing basis.

Except for a few special categories of publications the entries in the Compendium are grouped by fields of science as may be seen in the Table of Contents. The classification employed is arbitrary to some extent but in most cases will guide the user to the categories of properties in which he is interested. For information on specific properties or classes of substances an index is provided which can do no more than point to categories of substances and properties referred to in Compendium entries.

Unfortunately, it is beyond the scope of this volume to index every substance and every property value given in the many publications covered no matter how useful and desirable such a generalized index would be.

The entries in Chapter 3 of the Compendium, which is the most important part, are organized under the following headings: 1) Organization; 2) Coverage; 3) Analysis: and 4) Publications.

The first heading presents briefly information about the organization under which the work is done, i.e., the name of the director and number of his staff, sources of support and guidance, and history. The second gives factual information as to the substances covered and their states, the properties covered and the range of variables if appropriate, and the period of time covered. Under the term „Analysis" an effort is made to present facts and observations that reflect the aims of the compiler in evaluating and distributing the results of his work. Finally under „Publications" information is given leading the user to the source of the publication and its cost.

Under the term Analysis the concept of „critical evaluation of dat is included. Since CODATA has a primary interest in evaluated da a few words on evaluation are in order. The earliest compilations numerical data did no more than extract reported property valu from the literature and present these in tabular form to the use Not infrequently several values for the same property determin under similar conditions by different investigators were present without comment. Thus the user had no basis for differentiatic without intensive effort on his part. With the publication of tl *International Critical Tables* the concept of critical evaluation of da and critical tables emerged. In the preparation of such tables ea datum is the result of appraisal by experts of all available pertine information. The value presented is that which in the opinion of tl evaluating person or group best represents the numerical value the property in question. Today, more and more compilers of n merical data are striving to achieve high standards in the evaluatic of data. However, among the many compilations available the exists a spectrum of quality ranging from excellent to mediocre. I some cases the cause of less than optimum quality is simply th the state of development of measurement in a given field does n permit meaningful evaluation. But in other situations economic fa tors or urgent need may prevent expenditure of the time neede for careful evaluation; or the experience and competence of the co piling group may be at fault.

CODATA makes no claim of omniscience in judging the quality data compilations. The criteria used in selecting entries for the Con pendium have had to be flexible. Ideally every entry should meet th highest standards of quality. Actually most entries describe produc of high reliability. However, some publications are included tha could be improved. Justifications for including publications of le than top quality are based on criteria such as the following: (a) th data are adequate for their main use and are acceptable to a lar body of users; (b) the output of new projects initially may lack t highest quality but the anticipation is that experience will bring in provement; and (c) a continuing series of publications with volume written on different topics by different authors, may not be unifor in quality but the policy is to include all volumes of a given serie

This Compendium is addressed to two principal audiences. First, aims to help the compiler, would-be-compiler. or planner who mu know what activities and compilations exist so that new work can b planned effectively. This audience will probably be reasonably we satisfied by the present Compendium. The other audience comprise all scientists and engineers who must find reliable data for the calculations and research. The needs of this audience are usuall highly specific. It will seek numerical property values of specifi substances under particular conditions. The Compendium narrow the search for such users but can give only a source – not th actual data required.

CODATA plans revisions of this volume from time to time. Reader are requested to submit information about errors and omissions, an other suggestions for improvement to the Central Office of CODAT in Frankfurt, Germany.

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CODATA BULLETIN

A complementary publication to the CODATA Newsletter, entitled the CODATA *Bulletin*, is to appear in the near future. While news items of generally transient interest are included in the Newsletter, the CODATA *Bulletin*, both in format and content, will provide a more permanent record of information of long-term interest to the scientific and technical community. The *Bulletin* is intended primarily as an outlet for the reports, surveys and reviews produced by the National and Union Members of CODATA, and particularly by the CODATA Task Groups.

The first issue of the CODATA *Bulletin* is to be published in late 1969, and will comprise the first report of the CODATA Task Group on Computer Use, entitled "Automated Information Handling in Data Centres" (page 7).

Subsequent issues of the *Bulletin* will appear at irregular intervals as the need arises. Details of the availability and content of future CODATA *Bulletins* will be announced in the CODATA Newsletter.

CODATA NATIONAL MEMBERSHIP

1. CANADA

The **Canadian National Committee for CODATA** has now been formed with a membership as follows:

Dr. R. N. Jones, Chairman,
Division of Pure Chemistry,
National Research Council of Canada,
Sussex Drive, Ottawa 7, Ontario.

Mr. F. V. Cairns,
Division of Radio and Electrical Engineering,
National Research Council of Canada.

Mr. G. C. Hanna,
Chalk River Laboratories,
Atomic Energy of Canada Ltd.,
Chalk River, Ontario.

Dr. H. Preston-Thomas,
Division of Applied Physics,
National Research Council of Canada.

Prof. J. Trotter,
Department of Chemistry,
University of British Columbia,
Vancouver 8, British Columbia.

Dr. E. Whalley,
Division of Applied Chemistry,
National Research Council of Canada.

Dr. J. D. Babbitt (ex officio),
International Relations,
National Research Council of Canada.

The Committee held its inaugural meeting at the NRC headquarters in Ottawa on 30 May, 1969. In addition to the above committee members, the following observers were present: Mr. W.C. Brown (Radio and Electrical Engineering Division, National Research Council of Canada), Dr. J.E. Brown (National Science Library), Dr. F.C. Bray (Department of National Health and Welfare), Dr. C.F. Burk (Geological Survey of Canada), Dr. D. Cook (Spectroscopy Society of Canada), Dr. F. W. Matthews (Central Information Services, Canadian Industries Ltd.), and Prof. J.R. Wilson (Centre for Metal and Mineral Technology, Queen's University, Kingston). Also present were observers from the four divisions of the National Research Council, Pure Chemistry, Applied Chemistry, Pure Physics and Radio and Electrical Engineering.

The main object of this meeting was to assess the current status of data generation, evaluation, storage and retrieval in Canada.

The Canadian National Committee for CODATA will continue its surveillance over data activities in Canada. New developments will serve to up-date the Canadian contributions to CODATA publications such as „Automated Information Handling in Data Centres", and the „International Compendium of Numerical Data Projects".

2. ITALY

The processing of Italian membership on CODATA is at an advanced stage, and now requires only the formal approval of the Administrative Board of the Consiglio Nationale delle Ricerche (National Research Council). This formality is expected to be completed within a short time.

A working group comprising one member from each of the committees within the National Research Council (physics, chemistry, engineering), has been set up in order to consider data activities in Italy.

3. THE NETHERLANDS

In a letter to the Executive Director of CODATA dated 11 June, 1969, the Secretary of the Royal Netherlands Academy of Sciences and Letters (Koninklijke Nederlandse Akademie van Wetenschappen) has indicated that the Academy, as the national body adhering to ICSU, is willing to participate in the CODATA programme.

4. POLAND

At the 4th Annual Meeting of CODATA in Rome on 26-27 June, 1969, unanimous approval was given to the admission of Po-

land to membership on CODATA. The Polish national representative on CODATA is:

Dr. T. Plebanski,
National Board for Quality
Control and Measures,
Electoralna 2,
P.O. Box 10,
Warsaw 1, POLAND.

In Poland the programme on data for science and technology is jointly operated by the Polish Academy of Sciences and the National Board for Quality Control and Measures. This programme is at present limited to numerical reference data characterizing properties of substances and materials.

An Office of Standard Reference Data, with three staff members, was established in 1967/68 by the Division of Physico-Chemical Metrology of the National Board for Quality Control and Measures. The Office is now preparing plans for the funding of a National Centre of Numerical Reference Data.

A Polish National Committee on Numerical Reference Data for Science and Technology has now been named by the Secretary-General of the Polish Academy of Sciences. It is expected that approval of this Committee by the Presidium of the Academy will be forthcoming within a few months. The Committee will consist of about ten members, each representing one field of science or technology (physics, chemistry, electricity and electronics, metrology, mechanics, automation, etc.), and will be linked to appropriate national and international organizations.

With the sponsorship of CODATA, the Polish Academy of Sciences and the National Board for Quality Control and Measures have organized an International Symposium on Numerical Reference Data (page 10).

5. SWEDEN

Discussions are at present in progress in Sweden concerning the possibility of the participation of Sweden in CODATA activities. At these discussions, involving representatives of Swedish government, industry and universities, favourable opinion has been expressed regarding the membership of Sweden on CODATA.

6. UNITED KINGDOM

During the past year, the British National Committee on Data for Science and Technology has widened its membership to include representatives from industry. The Committee, now under the Chairmanship of Dame Kathleen Londsdale, has the following membership:

Chairman:
Dame Kathleen Lonsdale, D.B.E., F.R.S.,
125 a Dorset Road,
Bexhill-on-Sea,
Sussex.

Ex officio:
Professor M. J. Lighthill, F.R.S.,
Physical Secretary,
The Royal Society,
6 Carlton House Terrace,
London, S.W.1.

Sir Harold Thompson, F.R.S.,
Foreign Sectretary,
The Royal Society,
6 Carlton House Terrace,
London, S.W.1.

Sir Gordon Sutherland, F.R.S.,
Vice President of CODATA,
The Master's Lodge,
Emmanuel College,
Cambridge.

Royal Society:
Dr. S. Angus,
IUPAC Thermodynamic Tables Project,
Imperial College of Science and Technolog
Prince Consort Road,
London, S.W.7.

Professor Gordon Black, B.Sc., Ph.D.,
Department of Mathematics (Computatior
The University of Manchester Institute
Science and Technology,
Sackville Street,
Manchester, 1.

Dr. R.K. Callow, F.R.S.,
39 Hendon Wood Lane,
London, N.W.7.

Professor N. Kurti, F.R.S.,
The Clarendon Laboratory,
Parks Road,
Oxford.

Mr. R.W. McIntyre,
Rolls-Royce Ltd.,
Bristol Engine Division,
P.O. Box 3,
Filton,
Bristol.

Professor D.M. Newitt, M.C., F.R.S.,
Hollycot,
Runfold,
near Farnham,
Surrey.

Professor A. J.C. Wilson, F.R.S.,
Department of Physics,
The University,
Birmingham, 15.

Mr. B. Wood,
Merz and McLellan,
Milburn,
Esher,
Surrey.

Department of Education and Science:
Dr. R.E. Fairbairn,
Office for Scientific and Technical Informa
tion,
Elizabeth House,
39 York Road,
London, S.E.1.

Dr. H.T. Hookway,
Department of Education and Science,
Curzon Street,
London, W.1.

Ministry of Technology:
Dr. J.V. Dunworth, C.B., C.B.E.,
National Physical Laboratory,
Teddington,
Middlesex.

Mr. C.G. Giles, O.B.E.,
Ministry of Technology,
Abell House,
John Islip Street,
London, S.W.1.

The British National Committee has invited CODATA to hold its 5th Annual Meeting and 2nd International Conference (page 9) in the United Kingdom in 1970.

LIAISON REPRESENTATIVES ON CODATA

WORLD FEDERATION OF ENGINEERING ORGANIZATIONS

Liaison representation has been established between CODATA and the World Federation of Engineering Organizations (WFEO). At the 4th Annual Meeting of CODATA in Rome in June 1969, the WFEO was represented by Mr. J.R. Smith of the Institution of Electrical Engineers, London, U.K., who expressed confidence in the future mutually beneficial co-operation between WFEO and CODATA.

The World Federation of Engineering Organizations constitutes a counterpart in the engineering field to the International Council of Scientific Unions (ICSU). A common objective of ICSU and WFEO is the encouragement and co-ordination of international activities in respectively, the exact and natural sciences, and engineering.

The WFEO was formed at a constitutive assembly held at UNESCO House, Paris, in March 1968, and attended by 120 representatives of the engineering profession in 60 countries, and of four regional federations of engineering societies. At the constitutive assembly and the first General Assembly which followed, the Federation adopted a constitution developed over the previous two years by an international working group.

The membership of WFEO comprises National Members, representing the engineering profession in the participating countries, and International Members, representing the existing regional federations of engineering societies. The objects of the Federation are to advance engineering as a profession in the interest of the world community; to foster co-operation between engineering organizations throughout the world; and to undertake special projects by co-operation between the member organizations and in co-operation with other international bodies.

One such special project of particular interest to CODATA is the promotion by WFEO of a world-wide system of information dissemination and retrieval in the engineering field. At the WFEO General Assembly, it was resolved to establish a Committee of Information Services with the above terms of reference.

The first programme of work of this Committee, which is expected to include a world-wide survey of the status of engineering information, and the definition of user needs in both technologically advanced and developing nations, was considered by a six-nation working group which met in Paris on 31 July-1 August, 1969.

In engineering, as in the pure sciences, world-wide co-ordination of information services is essential in order to share experience and avoid duplication of effort, and also to establish common standards, so that storage media, such as magnetic tapes, are interchangeable throughout the world.

The second General Assembly of the World Federation of Engineering Organizations will be held in Beirut, Lebanon, in October, 1969.

The Officers of WFEO are:

President:	Dr. E. Choisy, Champvigny, Satigny, Geneva, SWITZERLAND
Vice President:	Mr. R. Gibrat, La Societé des Ingénieurs Civils de France, 19 rue Blanche, Paris 9e, FRANCE
Secretary-General:	Dr. G.F. Gainsborough, World Federation of Engineering Organizations, Savoy Place, London, W.C.2, ENGLAND

In addition to the WFEO, CODATA maintains liaison with the following international organizations:

Federation of Astronomical and Geophysical Services (FAGS)
ISCU Abstracting Board (IAB)
International Atomic Energy Agency (IAEA)
International Federation for Documentation (FID)
Organization for Economic Co-operation and Development (OECD)
United Nations Educational, Scientific and Cultural Organization (UNESCO)
World Meteorological Organization (WMO)

CODATA TASK GROUPS

Three CODATA Task Groups are now operational, and one is in the process of formation.

The work of the two original Task Groups, those on Computer Use, and on Key Values for Thermodynamics, has progressed according to the plans outlined in CODATA Newsletter 1.

The formation of the Task Group on Fundamental Constants is complete, and that of the new Task Group on Data for Chemical Kinetics is nearing completion.

1. TASK GROUP ON COMPUTER USE

The Task Group on Computer Use was established by CODATA for the purpose of „achieving maximum exchange of information about the methodology of handling data, including software, and to stimulate new work in this field".

At its first meeting, in 1967, the Task Group adopted a progamme of work, of which the first item was a survey of the current status of automated techniques used in data centres in various countries. Prior to carrying out this survey, the Task Group appointed an editorial committee consisting of J. d'Olier, France (Chairman), G. Black, U.K., and R. Fugmann, Germany-BRD. The committee members then collected relevant information on data centres, particularly those located in their respective countries; several other Task Group members supplied information about centres in other countries. These contributions were receibed during late 1967/early 1968, and after the up-dating of some of the older information, were combined to form a report on the survey. The final draft of this report was formally approved by the Task Group on Computer Use at its most recent meeting, held at the Royal Society, London, U. K., in June 1969.

The report entitled *Automated Information Handling in Data Centres* is a world-wide survey of the status in 1968 of automated techniques for the storage, processing and retrieval of numerical data. The Introduction to the report outlines the criteria used in selecting specific activities, and discusses in general terms the hard- and software, and input, storage and output equipment suitable for use by data centres. The survey is divided into six sections according to countries, which include U.S.A., U.K., France, Germany, Japan and Canada. Appropriate activities within each country are described with reference to organization, equipment and techniques, fields of interest, and services and output. It is considered that arrangement by country will facilitate any future up-dating of the report.

Automated Information Handling in Data Centres is to be published in late 1969 by the CODATA Central Office, as the first issue of the CODATA Bulletin. Details of price and ordering procedure will be given in CODATA Newsletter 3.

A recent change in the membership of the Task Group on Computer Use given in CODATA Newsletter 1, is the replacement of Dr. R. Fugmann by Dr. G. Ostertag, Friedrich Uhde GmbH, 6232 Bad Soden/Taunus, Germany - BRD.

2. TASK GROUP ON KEY VALUES FOR THERMODYNAMICS

The membership of the Task Group on Key Values for Thermodynamics was given in CODATA Newsletter 1. The Task Group also has four consultants as follows:

Dr. C.B. Alcock,
Dept. of Chemistry,
Imperial College of Science and Technology,
11 Prince's Gardens, S. Kensington,
London, S.W.7, ENGLAND

Dr. W.H. Evans,
Thermochemistry Section,
National Bureau of Standards,
Washington, D.C. 20234, U.S.A.

Dr. V. Medvedev,
Institute of High Temperature,
Krasnokazarmennay 17-2,
Moscow E-250, U.S.S.R.

Dr. Ingemar Wadsö,
Thermochemistry Laboratory,
University of Lund,
Tornavägen 13,
Lund, SWEDEN

3. TASK GROUP ON FUNDAMENTAL CONSTANTS

The following report by Dr. E. Richard Cohen, Chairman of the Task Group on Fundamental Constants, was prepared for the 4th Annual Meeting of CODATA.

The Task Group on Fundamental Constants was established in February, 1969, by the Committee on Data for Science and Technology, International Council of Scientific Unions. Its purpose is to develop a consistent set of fundamental constants which can be recommended for international use. The group as presently constituted is made up of the Chairman, six members representing the national standards laboratories of the United States, Canada, United Kingdom, U.S.S.R., Germany and Japan, as well as the Director of the International Bureau of Weights and Measures (who is also serving as the French representative) and the Chairman of the IUPAP Commission on Nuclidic Masses and Related Constants, as members-at-large. The membership of the Task Group is as follows:

Dr. E. Richard Cohen, Chairman,
Science Center, North American
Rockwell Corporation,
1049 Camino Dos Rios,
Thousand Oaks, California 91360,
U.S.A.

Dr. Richard D. Deslattes,
National Bureau of Standards,
Washington, D. C. 20234,
U.S.A.

Prof. H.E. Duckworth,
Department of Physics,
University of Manitoba,
Winnipeg, Manitoba,
CANADA

Dr. A. Horsfield,
National Physical Laboratory,
Teddington, Middlesex, England,
UNITED KINGDOM

Dr. B.A. Mamyrin,
Physical-Technical Institute of A.F. Joffe,
Polytechnic 26,
Leningrad K-21,
U.S.S.R.

Dr. B.N. Oleynick, Assistant Director,
Mendeleev All-Union Scientific
Research Institute of Metrology,
19 Moscow Prospekt,
Leningrad L-5,
U.S.S.R.

Dr. H. Preston-Thomas,
Division of Applied Physics,
National Research Council of Canada,
Ottawa 7,
CANADA

Prof. Dr. U. Stille,
Physikalische Technische Bundesanstalt,
Bundesallee 100,
33 Braunschweig
GERMANY - BRD

Dr. J. Terrien, Director,
International Bureau of Weights and Measures,
Pavillon de Breteuil,
Sevres F92, Paris,
FRANCE

Dr. Y. Yamamoto, Director,
National Research Laboratory of Metrology,
10-4, 1-Chome, Kaga, Itabashi-ku,
Tokyo,
JAPAN

The assignment of the Task Group is broad, and perhaps not yet fully defined by the task force membership. Its general objective is to provide a revision of the current recommended list of fundamental constants developed in 1963 by the U.S. National Research Council Interdivisional Committee on Fundamental Constants, and endorsed subsequently by IUPAP and IUPAC. A primary purpose of the present Task Group is to insure that the new revision should have interdisciplinary and international approval of the input data and of the consistent set of recommended values prior to publication, rather than mere acceptance of a final list.

It has become increasingly clear in the last several years that the 1963 analysis of the fundamental physical constants by DuMond and Cohen must be revised and that the values recommended at the time are in error by as much as 100 ppm. The strongest evidence for this revision came from measurements in 1967 of macroscopic phase coherence in superconductors by Langenberg, Parker and Taylor at the University of Pennsylvania. Their measured value of the quantum of magnetic flux ($h/2e$), measured with an accuracy of 4 ppm, was inconsistent with the 1963 recommendation by 10 times that amount. This verified the growing evidence from spectroscopic and microwave data that the value of the fine structure constant needed a revision of 20 ppm.

The most recent data on the value of the fine structure constant are the following:

a) Metcalf, Brandenberger and Baird [1] observed the anomalous scattering of Lyman-α radiation at 1216 Å by hydrogen atoms in a magnetic field. The anomalous angular distribution of scattered photons occurs when the magnetic field induces a level crossing of the $2P_{3/2}$ (m=-3/2) and $2P_{1/2}$ (m=+1/2) levels. They find $\alpha^{-1} = 137.0354 \pm 0.0006$.

b) Vorburger and Cosens [2] have measured the $2P_{3/2}$-$2S_{1/2}$ splitting in hydrogen by inducing the transition with an impressed microwave field in a magnetic field of approximately 0.04 T. When their measurements are combined with the most recent value of the Lamb Shift by Robiscoe, they find $\alpha^{-1} = 137.0358 \pm 0.0006$.

c) Kaufman, Lamb, Lea and Leventhal[3] have measured the same interval by inducing the transition from 2S to 2P with an rf electric field and observing the ensuing decay from 2P to 1S. Their measurements yield, when combined with a Lamb Shift S = 1057.82 $\pm$0.05 MHz, a value of 137.0350 $\pm$ 0.0004 for the reciprocal fine structure constant.

d) Langenberg, Parker and Taylor[4] observed discontinuities in the current-voltage characteristic of a Josephson junction in a microwave field. From the voltage interval between steps they deduce $2e/h$ = 483.5935 $\pm$ 0.0013 MHz/μV. When this value is combined with the gyromagnetic ratio of the proton, γ = 26751.96 $\pm$ 0.08 $s^{-1} G^{-1}$, this gives α^{-1} = 137.0360 $\pm$ 0.0002.

It is therefore clear that a complete revision of the 1963 recommendation is necessary. Such a revision will of course include experimental data in addition to that on the fine structure constant, inclucing careful attention to the electrical standards maintained by each national standards laboratory as recalibrated with respect to BIPM in 1968, effective 1 January 1969.

The fundamental constants to be considered for revision by the Task Group are as follows:

CONSTANT	SYMBOL
Speed of light in vacuum	c
Gravitational constant	G
Elementary charge	e
Avogadro constant	N_A
Mass unit	u
Electron rest mass	m_e
Proton rest mass	m_p
Neutron rest mass	m_n
Faraday constant	F
Planck constant	h
Fine-structure constant $2\pi e^2/hc$	α
Charge-to-mass ratio for electron	e/m_e
Quantum of magnetic flux	hc/e
Rydberg constant	$R\infty$
Bohr radius	a_o
Compton wavelength of electron	$\lambda_c = h/m_e c$
Gyromagnetic ratio of proton	γ
(Uncorrected for diamagnetism H_2O)	γ'
Bohr magneton	μ_B
Nuclear magneton	μ_N
Proton moment	μ_p
Gas constant	R_O
Boltzmann constant	k
First radiation constant $(2\pi hc2)$	c_1
Second radiation constant (hc/k)	c_2
Stephan-Boltzmann constant	σ

REFERENCES

1. H. Metcalf, J. Brandenberger, J.C. Baird, *Phys. Rev. Letters 21,* 165 (1968); J. Brandenberger, Ph.D. Thesis, Brown University, Providence, Rhode Island (1968).
2. T.V. Vorburger, B.L. Cosens, *Bull. APS. 14,* 525 (1969), Abstract BM9; B.L. Cosens (private communication).
3. S.L. Kaufmann, W.E. Lamb, K.R. Lea, M. Leventhal, *Bull. APS. 14,* 525 (1969), Abstract BM10; M. Leventhal, *Phys. Rev. Letters 20,* 625 (1966); Proceedings International Conf. on Atomic Physics, New York, 1968 (unpublished).
4. W.H. Parker, D.N. Langenberg, A. Denenstein, B.N. Taylor, *Phys. Rev. 177,* 639 (1969); B.N. Taylor, W.H. Parker, D.N. Langenberg, *Rev. Mod. Phys.* (to appear, July 1969).

4. TASK GROUP ON DATA FOR CHEMICAL KINETICS

Following the receipt of a proposal from Professor V.N. Kondratiev, President of the International Union of Pure and Applied Chemistry, the Bureau of CODATA discussed the formation of a Task Group on Data for Chemical Kinetics, at its 7th Meeting held in Frankfurt, Germany, on 27-28 January, 1969. It was agreed unanimously to establish such a Task Group, and to proceed on its formation and subsequent action as follows:

1. Through its Chairman and Executive Director, CODATA will solicit the names of experts of the different categories of the area of chemical kinetics, from the following:
   a. The Union Members of CODATA, especially the Member for the International Union of Pure and Applied Chemistry, who should obtain the advice of its President, Professor V. N. Kondratiev.
   b. The National Members of CODATA.
   c. Other persons knowledgeable in this area.
2. With these reports in hand, the Bureau of CODATA will select the persons who are to constitute the Task Group on Data for Chemical Kinetics and will name a Chairman.
3. The Task Group will be asked to do the following, utilizing the relevant services that may be available in the Central Office of CODATA:
   a. From the information given in the CODATA Compendium, plus any other information that may be available, determine what relevant data are presently being compiled, by whom, and where.
   b. From appropriate sources, determine, what relevant data, not presently being compiled, are needed by the scientific-technical community.
   c. Divide the total area of data for chemical kinetics into an appropriate number of categories, based upon scientific criteria.
   d. Identify these categories so listed as being under (a) above (data presently being compiled) or under (b) above (data not presently being compiled).
   e. Match the categories under (a) above (data presently being compiled), subdivided as necessary to recognize existing work projects, in such a way as to utilize all existing capabilities and resources with a minimum of actual duplication of effort.
   f. Insofar as possible, identify possible scientists, coupled with possible sources of support, that may be interested in beginning compilation work on the categories under (b) above (data not presently being compiled).
   g. Submit its findings and recommendations to the Bureau of CODATA.
4. The Bureau of CODATA will receive the report of the Task Group and take appropriate action.
5. CODATA will maintain a continuing cognizance over the area of data for chemical kinetics.

The formation of the Task Group on Data for Chemical Kinetics is nearing completion, (Items 1 and 2 above). The names of kinetics experts from Belgium, Canada, Germany, Japan, Switzerland, U.K., U.S.A. and U.S.S.R. have been forwarded to the Bureau of CODATA, which has named Prof. S.W. Benson, Stanford Research Institute, Menlo Park, California 94025, U.S.A., as Chairman. The Bureau, in close consultation with Prof. Benson, is now designating the membership of the Task Group.

The establishment of this Task Group by CODATA is particularly appropriate at the present time, due to the urgent and vital need to correlate the ever increasing quantity of experimental, and often contradictory, data on chemical kinetics, and to produce reliable tables of reaction rate constants. Such needs are stimulated both by the trends of chemical kinetics studies in many countries, and by the requirements of modern chemical technology.

Through the work of the Task Group on Data for Chemical Kinetics, it is hoped to rationalize and to co-ordinate on an international basis, the world-wide efforts at present being made in the field of chemical kinetics.

CODATA CONFERENCE

The **Second International CODATA Conference** on numerical data for science and technology will be held at St. Andrews, Scotland, U.K., on 7-11 September, 1970.

A programme committee, composed of experts from eight countries, has been set up in order to formulate the conference programme. This committee, under the Chairmanship of Dr. Christoph Schäfer, Executive Director, CODATA Central Office, has the following membership:

Dr. S. Angus, (Vice-Chairman),
IUPAC Thermodynamic Tables Project Centre,
Imperial College of Science and Technology,
Prince Consort Road,
London S.W. 7, U.K.

Mr. G. Denègre,
Bureau National de Metrologie,
1 rue Gaston Boissier,
75 Paris 15, FRANCE.

Dr. R.N. Jones,
National Research Council of Canada,
Sussex Drive,
Ottawa 7, CANADA.

Dr. Olga Kennard,
University Chemical Laboratory,
Lensfield Road,
Cambridge, U.K.

Prof. M. Kotani,
Faculty of Engineering Science,
Osaka University,
Osaka, JAPAN.

Academician M.A. Styrikovich,
Academy of Sciences of the U.S.S.R.,
Leninskiy Prospekt 14,
Moscow, B-71, U.S.S.R.

Prof. S. Sunner,
Thermochemistry Laboratory,
Lund University,
Lund, SWEDEN.

Dr. Guy Waddington,
National Academy of Sciences,
2101 Constitution Avenue,
Washington, D.C. 20418, U.S.A.

An organizing committee, responsible for local arrangements, has been set up by the Royal Society, who have also made a generous grant towards the costs of the conference.

It is expected that the Conference will be similar to the first International CODATA Conference, in both organization (morning and evening sessions, contributions by invitation) and size (approx. 100 participants).

GORDON RESEARCH CONFERENCE

A Gordon Research Conference on Numerical Data of Science and Technology was held at Tilton, New Hampshire, U.S.A., from 21 to 25 July, 1969. The Conference, attended by around 50 experts in the field of data compilation and evaluation, was chaired by N.B. Gove, Oak Ridge National Laboratory, with R.Hultgren as Vice - Chairman.

Topics discussed included transport properties (Chairman: Y.S. Touloukian, Panel: J.R. Ferron, M. Klein, J.R. Manning, R.W. Powell, S.C. Saxena), thermodynamics of phases of variable composition (Chairman: R. Hultgren, with L. Eyring, J. F. Elliott), nuclear data (Chairman: D.T. Goldman, with M.K. Drake, W.B. Ewbank, R.J. Howerton, C.M. Lederer) and thermal data (Chairman: D.R. Stull, with W.H. Evans, R.H. Harrison, E.K. Storms). Computer systems were discussed with reference to „what we have" (Chairman: J. Hilsenrath, with F.L. Alt, B.C. Duncan, R.L. Wigington) and „what we need" (Chairman: D.W. Cardwell, Panel: J.B. Fried, J. Hilsenrath, D.R. Stull, J.E. Suich). A general discussion on the achievement of reliability in data compiling was chaired by L.J. Kieffer.

The closing session on special topics included a report by C. Schäfer on CODATA, and reports by F.L. Alt and D.D. Wagman on the CODATA Task Groups on Computer Use, and on Key Values for Thermodynamics. U.S. activities were discussed by D.R. Lide (NSRDS) and by H. van Olphen, who described the role of the National Academy of Sciences in the data compilation field.

A topic of great current interest to CODATA, the fundamental constants, was discussed by E.R. Cohen, Chairman of the CODATA Task Group on Fundamental Constants. The Conference closed with a short progress report by F. J. Smith on the new computerized data bank on atomic and molecular physics at Queen's University, Northern Ireland, U.K.

INTERNATIONAL SYMPOSIUM ON NUMERICAL REFERENCE DATA

An International Symposium on Numerical Reference Data, co-sponsored by the Polish Academy of Sciences, the National Board for Quality Control and Measures of Poland, and CODATA, is to be held on 29 and 30 August, 1969, in Warsaw, Poland.

Attendance is expected to include arround 40 experts from 14 countries, including Belgium, Bulgaria, Canada, Czechoslovakia, Germany-BRD, France, German Democratic Republic, Hungary, the Netherlands, Rumania, Yugoslavia, U.K., U.S.A., and U.S.S.R., and approximately 60 scientists from the host country.

Reports will be presented on national data programmes and on activities in data centres; problems and methodology of data compilation, evaluation, storage and retrieval in specific areas of science will also be discussed. A particular emphasis will be on data for metrology and for industry, especially the gas and petroleum industries.

The Organizing Committee (Chairman: Prof. A. Bylicki: Vice-Chairman: Dr. T. Plebanski) will publish Proceedings of selected papers of the symposium.

INTERNATIONAL CONFERENCE ON PRECISION MEASUREMENTS AND FUNDAMENTAL CONSTANTS

An international conference on **Precision Measurements and Fundamental Constants** is planned by the National Bureau of Standards (NBS), U.S.A. The conference will be co-sponsored by the following four international organizations: International Bureau of Weights and Measures, International Union of Pure and Applied Chemistry, International Union of Pure and Applied Physics, and CODATA, and will be held at the National Bureau of Standards, Gaithersburg, Maryland (near Washington, D.C.), U.S.A., from 3-7 August, 1970.

OFFICE FOR SCIENTIFIC AND TECHNICAL INFORMATION (OSTI), U.K.

OSTI has a new address as follows:

Office for Scientific and Technical Information,
Elizabeth House,
York Road,
London, S.E.1,
England.
Telephone: 01-928 9222

OSTI has recently awarded a grant to the Queen's University of Belfast, Belfast BT 7 1NN, Northern Ireland, U.K., for research and development associated with the establishment of a **Data Bank in Atomic and Molecular Physics.** This work is being carried out in the Department of Applied Mathematics and Theoretical Physics, under the supervision of Dr. F.J. Smith.

Its aims are to collect numerical data in the field of atomic and molecular physics, such as intermolecular potentials, computed atomic wave functions, cross sections and rate coefficients; and to study and develop the most efficient methods for the computer storage and on-line retrieval of the data.

It is hoped that the establishment of such a data bank will encourage and facilitate the storage of data which are too voluminous for publication, but of sufficient potential interest to warrant retention.

Since only a few systems of this type are operational, e.g., Project Intrex at the Massachusetts Institute of Technology, U.S.A., and an interactive computer for searching electronics patents at IBM, Germany, any viable techniques that emerge from this study are likely to find wide application in fields other than atomic and molecular physics.

Two well-established data centres in the U.K. have received extended support from OSTI.

The **Crystallographic Data Centre** in Cambridge will compile an up-dated volume covering the period 1960 - 65 of *Inter-atomic Distance Tables* for organic compounds. The bibliography and tables are scheduled for publication in respectively 1970 and 1971.

The critical evaluation of rate data for chemical reactions of interest in the high-temperature field will now continue for a further year until September 1971, at the **High-Temperature Reaction Rate Data Centre** at the University of Leeds.

NEW JOURNALS

ATOMIC DATA

The first issue of a new compilation journal entitled *Atomic Data* is to be published in September 1969 by Academic Press, Inc., New York, U.S.A.

Atomic Data will constitute a counterpart in the field of atomic and molecular physics to the compilation journal *Nuclear Data*, which has successfully demonstrated the feasibility of journal publication of compilations of experimental and theoretical data in the field of nuclear-structure physics.

The fields covered will include energy levels, wavefunctions, line-broadening parameters, collision processes, interaction cross sections of atoms and simple molecules, transition probabilities, penetration of matter by charged particles, etc.

Correspondence on contributions to *Atomic Data* should be addressed to: Katharine Way, Editor, Atomic Data, Department of Physics, Duke University, Durham, N.C. 27706, U.S.A., or to either of the associate editors: C.F. Barnett, Director, Atomic and Molecular Processes Information Center, Oak Ridge National Laboratory, P.O. Box Y, Oak Ridge, Tenn. 37831, U.S.A., and L.J. Kieffer, Director, Atomic Collision Cross Section Information Center, Joint Institute for Laboratory Astrophysics, University of Colorado, Boulder, Colo. 80304, U.S.A.

ORGANIC MAGNETIC RESONANCE (OMR)

The first issue of a bi-monthly journal entitled *Organic Magnetic Resonance* was published by Heyden and Son Ltd., London, England, in February 1969.

This international journal is devoted specifically to all the branches of magnetic resonance as applied in organic chemistry, and includes papers on nuclear magnetic resonance (NMR), nuclear quadrupole resonance (NQR), electron spin resonance (ESR), and the more recently developed technique of ion cyclotron resonance (ICR).

A noteworthy feature of the journal is the *Spectral Supplemen* in which the spectra of the compounds discussed in the paper are reproduced in standard format, together with experimenta details. The format, separate publication and indexing of the *Spec tral Supplements*, of which extra copies are available, facilitat the collection of Supplements to form a compilation of OMF spectra.

Papers in English, French or German should be submitted to th Editor-in-Chief, Dr. E.F. Mooney, University of Birmingham, P.O Box 363, Birmingham, 15, England. Subscription information from Heyden and Son Ltd., Spectrum House, Alderton Crescent, London N.W.4, England.

INTERNATIONAL JOURNAL OF CHEMICAL KINETICS

In view of the potential involvement of CODATA in chemical kinetics through its Task Group on Data for Chemical Kinetics, the publication of a new bimonthly journal covering this field is of interest. Editor of the Journal is Prof. S.W. Benson, Chairman of the CODATA Task Group.

The first issue of the *International Journal of Chemical Kinetics* was published by John Wiley and Sons, Inc., in January 1969, and issue No. 4 (July/August) has recently appeared.

The new international journal covers inorganic, organic and biochemical kinetics, including reaction mechanisms, and publishes in particular those papers which explore the quantitative relationship between molecular structure and chemical reactivity. Review articles on special chemical reactions of significant current interest are also included. It is hoped that the Journal will encourage the establishment of a more uniform set of standards for judging kinetics research.

Manuscripts should be submitted to: Prof. S.W. Benson, Stanford Research Institute, Menlo Park, California 94025, U.S.A. Papers in languages other than English require a comprehensive synopsis in English.

Subscription information from: Periodicals Division, Interscience Publishers, John Wiley and Sons, Inc., 605 Third Avenue, New York, N.Y. 10016, U.S.A.

THE JOURNAL OF CHEMICAL THERMODYNAMICS

The first issue of *The Journal of Chemical Thermodynamics* was published by Academic Press Inc. (London) Ltd., in January 1969, with a further five issues scheduled for publication in 1969.

The Journal comprises papers dealing with thermochemical and equilibrium studies on chemical reactions, and with the measurement of thermodynamic properties of single and multicomponent systems by calorimetric, *pVT*, spectroscopic, and other methods. Areas covered include all topics currently treated in the *Bulletin of Thermodynamics and Thermochemistry*; papers of thermodynamic content on systems of interest to biochemists, metallurgists and physicists are also included. A general policy is the full presentation of the results of accurate measurements.

The appointment of both the Editors and Advisory Board of the Journal was made by a Task Group set up for the purpose by members of the Commission on Thermodynamics and Thermochemistry of the International Union of Pure and Applied Chemistry.

Papers in the English language should be submitted to any of the three Editors: M.L. McGlashan, Department of Chemistry, The University, Exeter, Devon, England; H.A. Skinner, Department of Chemistry, The University, Manchester M 13 9PL, England; Edgar F. Westrum, Jr., Department of Chemistry, The University of Michegan, Ann Arbor, Michegan 48104, U.S.A.

Subscription information from: Academic Press Inc. (London) Ltd., Berkeley Square House, Berkeley Square, London W1X 6BA, England.

NEW PUBLICATIONS

DATA ACTIVITIES IN BRITAIN

A new and enlarged edition of the survey formerly entitled *Critical Data in Britain* (2nd edition, May 1967) has recently been issued by the Office for Scientific and Technical Information (OSTI), U.K. The change in title to *Data Activities in Britain* reflects a broadening of scope and an increase in reference sources, which together have resulted in an increase in entries from 38 in the earlier listing to approximately 100 in the revised survey.

Entries in the earlier edition were restricted to data defined as the product of critical evaluation of the basic properties of definable systems, while the present edition comprises a more comprehensive coverage of compilations of data and related activities in the U.K. Several OSTI supported projects in experimental handling of data are described, where the object is not only to set up a service in a special field, but to develop methods generally applicable to data handling.

The survey is divided into eight sections covering atomic and molecular properties (spectra, collision processes, crystallography, radio chemistry, theoretical), analysis, thermodynamic and thermophysical properties, kinetics (chemical, diffusion), acoustics, electrical and magnetic properties, physical and mechanical properties of materials (metals, constructional materials, refractory materials, rocks and minerals, biological materials), and design (materials, manufactured articles, design in relation to human beings).

The individual entries are described in a similar manner to those in the CODATA *International Compendium of Numerical Data Projects*, i.e. under the headings „Organization", „Coverage and Analysis", and „Publications". Such an arrangement greatly facilitates the selection and inclusion of the U.K. contribution to the Compendium.

Data Activities in Britain is available free of charge from OSTI (address above).

NBS PUBLICATIONS

1969 publications from the National Standard Reference Data System (NSRDS) of the U.S. National Bureau of Standards are as follows:

NBS Technical Note 270-4, *Selected Values of Chemical Thermodynamic Properties, Tables for Elements 35 through 53 in the Standard Order of Arrangement,* by D.D. Wagman, W.H. Evans, V.B. Parker, I. Halow, S.M. Bailey and R.H. Schumm, ($1.25).

NBS Technical Note 474, *Critically Evaluated Transition Probabilities* for Ba I and II, by B.M. Miles and W.L. Wiese, (0.30).

NBS Technical Note 482, *Superconductive Materials and Some of Their Properties,* by B.W. Roberts, ($1.25).

NBS Technical Note 484, *A Review of Rate Constants of Selected Reactions of Interest in Re-entry Flow Fields in the Atmosphere,* by M.H. Bortner, ($0.60).

NBS Monograph 70-Volume III, *Microwave Spectral Tables, Polyatomic Molecules with Internal Rotation,* by P.F. Wacker, M.S. Cord, D.G. Burkhard, J.D. Petersen and R.F. Kukol, ($4.25).

NSRDS - NBS - 26, *Ionization Potentials, Appearance Potentials, and Heats of Formation of Gaseous Positive Ions,* by J.L. Franklin, J.G. Dillard, H.M. Rosenstock, J.T. Herron, K. Draxl and F.H. Field, ($4.00).

This publication presents essentially all of the values of ionization and appearance potentials of positive ions reported since 1955, and includes a set of „best" values of heats of formation of gaseous ions. The bibliography of more than 700 references covers the literature from 1955 to mid - 1966 on gaseous phenomena, which now include aspects of vacuum ultraviolet spectroscopy, inelastic electron scattering, photoionization, photoelectron spectroscopy, charge exchange and theoretical chemistry.

NSRDS - NBS - 27, *Thermodynamic Properties of Argon from Triple Point to 300K at Pressures to 1000 Atmospheres,* by A.L. Gosman, R.D. McCarty and J.G. Hust, ($1.25).

The most recent publication in the NSRDS Series presents tabular values of density, internal energy, enthalpy and entropy of liquid and gaseous argon. Diagrams of specific heats, compressibility factor and entropy are included for the temperature and pressure ranges 83.8 to 300 K and 0.01 to 1000 atmospheres. The properties presented were calculated from an equation of state which was fitted to experimental PVT data from the world literature. Extensive comparisons of the equations of state are made, and the experimental data and deviation plots are presented. The second virial coefficient and Joule-Thomson inversion curve were also calculated and comparisons made with values from other sources. A vapour pressure equation that covers the range from triple point to 300K is also given.

The following publications in the NSRDS Series are to be issued within the next month:

NSRDS-NBS-28, *Molten Salts, Volume II, Section 1, Electrochemistry of Molten Salts: Gibbs Free Energies and Excess Free Energies from Equilibrium Type Cells; Section 2, Surface Tension Data,* by G.J. Janz et al, ($2.75).

NSRDS-NBS-29, *Photon Cross Sections, Attenuation Coefficients and Energy Absorption Coefficients From 10 KeV to 100 GeV,* by J.H. Hubbell, ($0.75).

The above NBS publications are available from: Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402, U.S.A., price as above in U.S.A., Canada, Mexico, and some Central and South American countries. For all other countries add 1/4 of price for postage. Payment in U.S.A. by cheque, money order (payable to „Superintendent of Documents"), or Superintendent of Documents coupons or deposit account; in other countries either by international money order or draft on an American bank (postage stamps not acceptable). When ordering state full identification symbols, e.g. NSRDS-NBS-27, title of publication, and names of authors.

A complete listing of NSRDS and related NBS publications issued before 1 January, 1969, is available from: Information Services, Office of Standard Reference Data, Room A521, Administration Building, National Bureau of Standards, Washington, D.C.20234, U.S.A.

ICSU CODATA Central Office

Westendstrasse 19, 6 Frankfurt/Main, Germany-BRD, Tel. (0611) 748044, Cable: ICSUCODATA

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