

47 CODATA / NEWSLETTER

JANUARY 1989

CODATA/DOE Workshop on Ethical & Technical Aspects of DNA Mapping

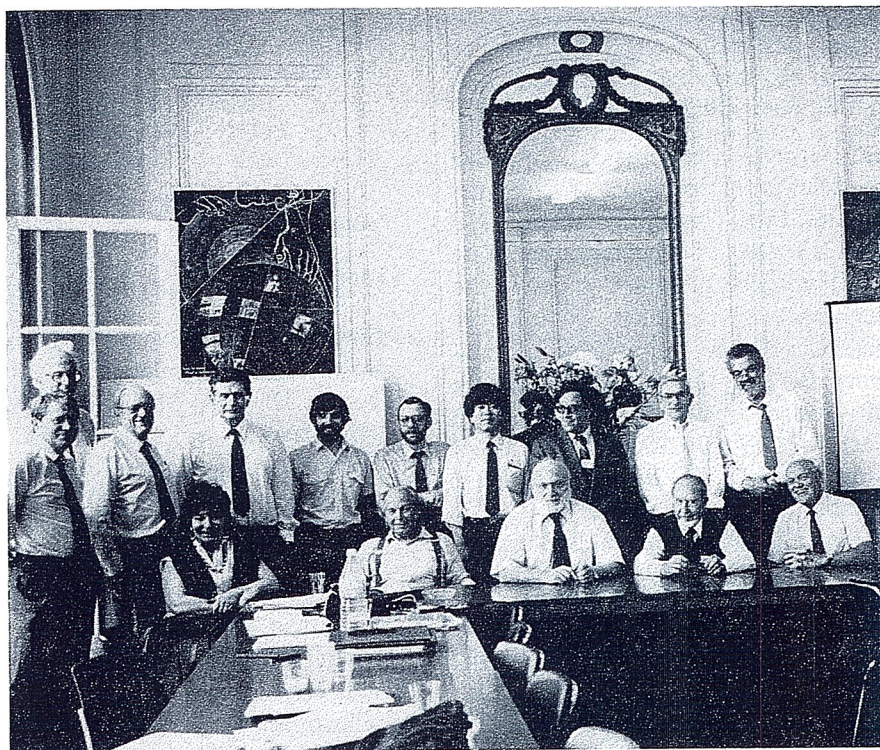
Meeting at the Paris Secretariat in June 1988, the Workshop dealt with ethical and other aspects of DNA mapping. Further details about their deliberations may be found on page 4.

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

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



Standing l to r: L. Réchaussat, G. Bell, I. C. Gunsalus, J.-E. Dubois, C. Rawlings, B. Nieuwenhuis, M. Kanehisa, C. de Lisi, P. Silverman, L. Philipson. Seated l to r: P. Glaeser, P. Slonimski, J. Lederberg, A. E. Bussard, B. Keil.

5th International Conference on Statistical and Scientific Database Management

The 5th SSDBM will take place at Charlotte, North Carolina, USA on April 3-5, 1990, sponsored by EUROSTAT, IASC, University of North Carolina-Charlotte, and ENEA. It continues the series of conferences started seven years ago in California (1981, 1983), then in Europe (Luxembourg, 1986 and Rome 1988).

The purpose of this conference is to bring together database researchers, users, and system builders, to discuss the particular issues of interest, to propose new solutions to the problems of the area, and to extend the themes of the previous conferences, both from the theoretical and from the applicative point of view. Papers are on new concepts, new ideas, and new research results having to do with databases and knowledge bases. Major topics of interest are--but not limited to--modelling and semantics, query languages and user interfaces, physical organization, security, scientific databases, data analysis and performance evaluation, temporal and spatial data, and various applications.

The General Chairman is Zbigniew Michalewicz (Department of Computer Science, UNC-Charlotte, Charlotte, NC 28223, USA). Five copies of complete papers may be submitted to one of the conference co-chairmen: (American continent): Dr. Doron Rotem, Lawrence Berkeley Laboratory, University of California, One Cyclotron Road, Berkeley, CA 94720; (for all other countries): Dr. H. Hinterberger, ETH Zurich, Institut Informatik, RTH-Zentrum, CH-8092 Zurich, Switzerland prior to May 31, 1989. Information may also be obtained from these co-chairmen.

Thermodynamic Data: "The Floppy Book"

For scientists and engineers using data, the *Floppy Book* is a revolutionary tool that provides speed and accuracy. Loading a floppy disk into an IBM PC and running it yields data sets, plots, and text. A user-friendly program

selects the desired data set, draws a chosen plot, and creates an external file.

At present *Floppy Books* comprises volume-on-disks based on the Thermodynamic Data for Technology Series compilations by A. Maczynski *et al.*, the Institute of Physical Chemistry, Polish Academy of Sciences. The range of materials presently available includes:

- Verified pressure data for nitrogen containing organic compounds,
- Second virial coefficients,
- Vapor/liquid equilibrium data on binary systems of hydrocarbons and halogen, pnictide, or chalcogen containing substances.

Typical prices for the presently available volumes are in the vicinity of 70 SFr including postage and packing.

Further information is available from: DHN Ltd., The Trade Center of Polish Science, P. O. Box 410, 00-950 Warsaw, Poland. (Telex: 817529).

The *Floppy Books* library are to be continually updated. The users will be informed of any new volumes or supplement-disks available. Those who wish to preview contents, operation mode, and test the usefulness of a *Floppy Book* may order a sample disk, adapted to IBM PC AT/XT compatible computers.

1989 China Scientific Tour

Two programs of environmental significance are offered in Fall 1989 organized by the South China Association for International Exchanges, Academia Sinica. The first (23 October through 11 November) features the Traditional Farming System in the Pearl River Delta (the fish/mulberry/silkworm cycle). Fish-pond mud, fertile with fish excreta and excess feed, is dug up to cover roots of mulberry trees, mulberry leaves feed silkworms, and silkworm excreta are fed to fish. The second (25 September through 14 October) concerns wild life and vegetation in the Dinghuahan Reserve (UN MaB program), Guangdong Province, and Shannongjie Reserve, Hubei Province. For further information, contact: Dr. Xiong Guoyan, Foreign Affairs Office,

Guangzhou Branch of Academia Sinica, 100 Xianliezhong Road, Guangzhou, China. Tel.: 775213; 775600 ext 298 (private). Telex: 44514 OSICG CN. FAX: 86-202-758618.

Dr. G. C. Carter, Numerical Data Advisory Board, National Research Council, 2101 Constitution Avenue, Washington, D.C. may be able to provide further information to North Americans. Tel.: 202-334-2755. Telex: 248664 NASW UR.

The costs in China have been arranged by the Academy to be economical for participants.

ICSU Beijing General Assembly

From the remarks of the newly elected President of ICSU at the September 1988 meeting, the following are especially pertinent:

"Each one of us has many loyalties: to science and our respective disciplines, to our institutions and professional responsibilities, to our countries and so on. On the basis of these we tend to proceed in many different directions. It is ICSU which brings all of us together as a coherent cohesive scientific community; and makes efforts to ensure that there is an orchestrated global effort for the development of science which is humankind's greatest creative effort and to work for the proper uses of science, keeping in view the highest principles of science. It is for this reason that ICSU is a non-governmental association of scientists and has concerned itself with the ethical problems of science, the meaningful development of science in the Third World countries, anticipating problems before they arise and suggesting innovative analysis and solutions, such as the programmes on Global Change or Natural Disasters. In fulfilment of these objectives, ICSU has significantly expanded its activities in recent years. The efforts and resources needed over the next years for these activities will be quite significant. I am confident that they will become available with the fullest cooperation of all those who constitute ICSU and are sympathetic to its objectives and that we can report major progress at the next General Assembly.

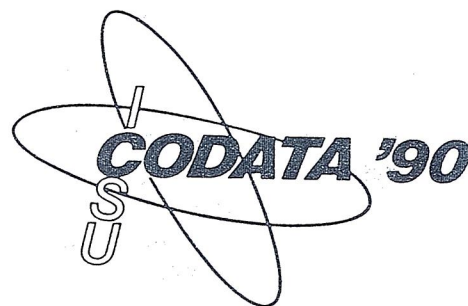
The Twelfth International CODATA Conference

"Data for Discovery"

15-21 July 1990

Columbus, Ohio, U.S.A.

Hyatt on Capital Square Hotel



Join the excitement as leading researchers share their approaches to improving the quality, reliability, management, and accessibility of data of importance to science and technology at the 12th International CODATA Conference, "Data for Discovery."

Practitioners in all scientific disciplines, especially those in the physical, biological, geological, and astronomical sciences concerned with the management of quantitative data resulting from experimental measurements or observations, will find this Conference of benefit.

CODATA '90, "Data for Discovery," provides a forum for covering major topics in broad disciplinary or interdisciplinary sessions with invited and contributed papers and posters on:

- Scientific data consolidation and processing;
- Technology and management of computerized databases;
- Computerized data and systems analysis;
- Information systems in materials science technology and engineering;
- Bioscience and geoscience numerical information processing; and much more.

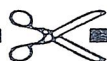
The scientific program will consist of oral presentations (both invited and contributed) and poster presentations covering a broad spectrum of data related scientific topics to be announced in detail in subsequent Newsletters.

The Columbus Local Organizing Committee for the CODATA '90 Conference is planning a number of activities for participants and their accompanying guests. These include receptions, dinners, concerts, visual art showings, and tours.

Columbus is situated in the center of the State of Ohio. Due to its central location, the Columbus International Airport provides direct flight service to 22 domestic and Canadian cities and one-stop service to most European and Asian cities.

Members of the Columbus Local Organizing Committee hosting CODATA '90 are: Applied Information Technologies Research Center, Ashland Chemical Company, Battelle Memorial Institute, Chemical Abstracts Service, CompuServe, OCLC-Online Computer Library Center, and the Ohio State University.

Space for exhibits about equipment and/or services relevant to CODATA's interests, scientific books, and database demonstrations for scientific and technical database producers will be available.



I am interested in the 12th International CODATA '90 Conference to be held in Columbus, Ohio, U.S.A. from 15-21 July 1990.

Please send additional information as it becomes available, including information on exhibiting: ☐ equipment/services; ☐ books; ☐ Database demonstrations.

Mail to: Applied Information Technologies Institute
Attn: CODATA '90 Conference, "Data for Discovery"
1880 Mackenzie Drive, Suite 111
Columbus, Ohio 43220, U.S.A.

Telephone: (614) 442-1955

My address is as follows (please print clearly):

First name (initials)
and family name: _____

Title/affiliation: _____

Full mailing address: _____

Telephone number: _____

Telex number: _____

Signature: _____

An International Workshop on Ethical and Technical Aspects of DNA Mapping

This workshop was organized by CODATA (Prof. Alain Bussard) and the USA Department of Energy (DOE) (Prof. Charles De Lisi), 13 and 14 June 1988 in Paris.

The participants were the following: Profs. George Bell (Los Alamos Lab), Alain Bussard (CODATA), Charles De Lisi (DOE), Jacques-Emile Dubois (Paris VII), I.C. Gunsalus (UNIDO), Minoru Kanehisa (Kyoto), Boja Keil (Institut Pasteur), Joshua Lederberg (Rockefeller University), and Drs. B. Nieuwenhuis (EEC), Lennart Philipson (EMBL, Heidelberg), Louis Rechaussat (INSERM), Chris Rawlings (ICRF London), Paul Silverman (Lawrence Berkeley Lab), Piotr Slonimski (CNRS, Gif sur Yvette), with Dr. F.W.G. Baker (ICSU), Ms. Beatrice Dutertre (CERDIC, Nice), and Mrs. Phyllis Glaeser (CODATA) as observers.

The following motions were approved for submission to CODATA and to ICSU.

1) Data on the genome of living beings. The legal standing of intellectual property connected with the determination and publication of DNA sequences has not so far been extensively tested in the courts. In the United States, one legal scholar affirms the analogy between a genetic map and a geographic one: that is, that there is appropriate copyright protection on the expression of a map, but not on the abstract scientific information contained therein. At one extreme a mere copying of a published map *in extenso* would constitute a copyright infringement. At the other, there is absolutely no bar to a mapper independently re-acquiring the same information that is available from nature and making any use thereof that he or she sees fit. In between, there is a gray area (yet to be spelled out either in cartography or in DNA studies) about the extent to which existing published information must be reworked in order to be free of the limitations of copyright. Our committee endorses this approach to the question of intellectual property interests in DNA sequences. In all circumstances, scientific information about DNA as it occurs in nature should remain in the public domain and free of any encumbrance either under copyright or under patent law.

2) Status of databases and of their managers. Formal submission of sequence data to a database must be accepted as an alternative to publication and database managers should have a status comparable to that of a journal editor. Submission of sequences, their analysis, and theoretical predictions based on such data must become accepted as an increasingly important part of biological research.

3) Increasing awareness of the public towards biological research on the genome. Insofar as the description and interpretation of the genome of living species, including man, are part of universal knowledge, scientists involved in this research should be aware of the necessity for a wide distribution of this information to the population at large. This is especially needed relative to studies of the *human* genome about which the public is highly sensitized. Scientists conducting such research should strive to explain their work to the public. Special attention should be paid to the popularization of this information and its distribution in developing countries.

4) Need for new computational methods to study DNA at different levels of complexity. Although the acquisition and analysis of nucleic acid sequence data is the primary goal of the human genome sequencing project, it is important to recognize the importance of other computational techniques that will be required to elucidate the structure and function of human gene products. These will include pattern recognition and sequence alignment methods, the prediction of secondary and tertiary structure of nucleic acid and proteins from primary sequence data, protein modelling, molecular graphics, and molecular dynamics. It is important to encourage a parallel effort to develop systematic definitions of the physical properties, structure, and function of biomolecules as a basis for future generations of molecular biology databases.

5) Necessity for international agreement on format and nomenclature of DNA sequences. It is important to emphasize that format and nomenclature be coordinated internationally for the identification of the individual clones accumulated in repositories organized from the genome mapping projects. It is desirable to achieve an integrated effort by transferring current nodes of the nucleic acid databases.

Scientific and Technical Data in a New Era

11th International CODATA Conference, Karlsruhe, September 1988

The sources, applications and handling of data in the field of science and technology are of growing importance in a rapidly changing modern world. To encourage the sharing of new ideas and to provide a forum for the presentation of recent results, a multidisciplinary program was held embracing oral presentations (both invited and contributed) and poster presentations covering:

- Biosciences and Biotechnology,
- Industry and Technology,
- Safety and Environmental Protection,
- Geo- and Space Sciences,
- Scientific Aspects of Collecting and Distributing Data,
- Legal and Social Aspect of Data Dissemination, and
- Innovations in Data Handling

The site of the conference was the new Karlsruhe Congress and Exhibition Center on the Festplatz. The credit for the highly successful and well attended meeting accrues to Dr. Heinrich Behrens and the International Scientific Program Committee as well as the Local Organizing Committee.

For the benefit of those unable to attend, the presentations are being summarized in a proceedings volume to be published in 1989 by Hemisphere Publishing Corporation, New York.

DR. SELBY ANGUS

Selby Angus was born in November 1922 in County Durham in the north-east of England, the son of a locomotive engineer, and was educated at Blackburn Grammar School. Although he did well in his school examinations, his parents were not in favour of his going to the university. As he was determined to continue his studies, he took a job in the laboratories of one of Imperial Chemical Industry's process plants and attended Constantine College in Middlesbrough as a part-time science student to work for a Bachelor's Degree validated by the University of London. He interrupted these studies in 1942 by volunteering for service in the Armed Forces and was drafted into the Royal Army Ordnance Corps as an Ammunition examiner, where his tour of duty covered sites across the south-east of England. In 1943 he married Mary Richardson and they had two sons and a daughter.

In 1946 he was given special release from the Army to attend the University, and in 1949 he obtained a BSc(Eng) in Chemical Engineering at the Imperial College of Science and Technology in London, where he continued working for the rest of his career. After graduation he worked for a number of years under Professor D. M. Newitt FRS on the properties of steam. The research involved the design and construction of an apparatus for the direct measurement of the specific enthalpy of steam in order to extend the limits of the 1934 Skeleton Steam Tables from 550 °C and 350 atm to 700 °C and 1000 atm. The method used was based on the work of Egerton and Callendar at Imperial College in the 1930's. For his work on this project, Selby was awarded a PhD, and the properties of steam always remained as one of his major research interests.

It was during the period that Selby learnt the importance of accuracy, the economic significance that this can have, and the amount of effort and care which is required to achieve it; and it was this experience which made him the natural choice for the first Scientific Director of the IUPAC Thermodynamic Tables Project Centre which was set up by the IUPAC Commission on Thermodynamics. The Project was initiated by Professor Newitt, who was a member of both IAPS and IUPAC, and had long encouraged the development of accurate tables of thermodynamic properties, as well as himself being a contributor to Din's original tables.

The Thermodynamic Tables Project Centre was founded at Imperial College in 1963, and Selby travelled widely in the early years, visiting all those laboratories where accurate thermodynamic measurements were being made, and where high quality correlation work was beginning to be developed. This involved visits throughout Europe, to the United States, to the USSR and to Japan. Selby obtained worldwide cooperation for the Project and set up international working groups for all the fluids selected for study. He set the high standards of accuracy and the careful and thorough reporting

27th November 1922 - 7th December 1987

of experimental results which is now widely followed by all those working in this field.

The Centre remained small, with only three scientists, but its contribution to the development of the methods used for critical evaluation of the experimental data, the correlation of the data into accurate equations of state, and the careful and thorough reporting of the results has been considerable. The ten volumes in the series International Thermodynamic Tables of the Fluid State published by IUPAC, and bearing his name, illustrate those changes in methods which have taken place over the years, and Selby's "Guide for the Preparation of Thermodynamic Tables and Correlations of the Fluid State" is a summary of the methods up to 1983.



Selby had a love of the English language, which was already seen in his student days when he was both a contributor and editor of "Phoenix," the College magazine which had been founded by H. G. Wells. Following that author's tradition of science fiction, he and his friend Tony de Reuck wrote an article on the history of science fiction which was published in the "New Statesman" magazine under the pseudonym of Jonathan Staggers and later appeared in a book of belles-lettres for the use of students of English.

Selby was a founder member of the UK Committee for the Properties of Steam, and as a member of IAPS he assisted in the preparation of its current statutes and bylaws; his many contributions were acknowledged by his colleagues in 1987 when they elected him an Honorary Fellow of IAPS. He served as Secretary of the IUPAC Commission on Thermodynamics from 1982-85 and was the UK

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Chinese Scientific Databases

Professor Mooson Kwauk (together with Professors Zhang Xiaoyang, Xu Zhihong, Hu Yaru, Wang Leshan, and others) compiled and presented an extensive report on databases in PRC at the Ottawa 1986 CODATA Conference. Because of general interest this material has been updated by Professor Hu Yaru and others and a terse status report on the main scientific databases was presented in part in the previous issue. This issue continues with China's development of data from indigenous investigations, which could be of value elsewhere for basic scientific understanding. Several interesting examples are enumerated.

PROTEIN SEQUENCES

Laboratories in the fields of biochemistry, medical biology and especially molecular biology are interested in databases involving the following aspects of protein sequence determination.

- **Abnormal Hemoglobins.** A cooperative group of laboratories in 18 Chinese cities, including the Academy of Medical Science of China, Children's Hospital of Shanghai, and Hunan Medical School, has since 1979 been engaged in the study of abnormal hemoglobins in China. By 1983, a population of 200 000 had been surveyed hemologically in different areas and among different ethnic groups, and 692 cases of abnormal hemoglobins were found, which can be divided into 22 types belonging to 170 family systems. Three of those types were discovered for the first time.
- **Insulin Sequences.** Following the total chemical synthesis of insulin in China in the 1960's, research on its structure and function has been carried out during the succeeding years in a number of laboratories in China. Insulin sequences of silver carp, duck, goose, and certain species of snakes have been defined for the first time in Chinese laboratories.
- **Traditional Chinese Medicines.** Trichosanthin, as an example, is the active component of Trichosanthes roots used to induce abortion in relatively late pregnancy. It has been studied both functionally and structurally with the aid of X-ray crystallography at a resolution of 3 Å. It is a glycoprotein with a single peptide chain composed of 221 amino acid residues, the sequence of which has been studied, and the complete sequencing is expected before long from the Institute of Organic Chemistry in Shanghai.
- **Trypsin Inhibitors.** Several trypsin inhibitors from mungbean, trichosanthin, broad bean, etc., have been characterized and sequenced, notably at the Institute of Biochemistry, the Chinese Academy of Sciences (CAS), with simultaneous studies on structure-function relationships.

- **Toxic Proteins.** Certain phosphosterases and neurotoxins extracted from snake and scorpion venoms have been sequenced.

- **Nucleic Acids.** The Institute of Biochemistry, Institute of Biophysics and Institute of Microbiology, all belonging to CAS and the Academy of Medical Science of China, as well as a number of universities have been engaged in nucleic acid sequence determination on 5s ribosome RNA from fish, cotton seeds, and other plants, the posterior silk gland of silkworm, and the total brain of mouse, t-RNA (gly-t-RNA), virus DNA, and other DNA used in genetic engineering.

ENVIRONMENTAL MONITORING

China's Environmental Protection Agency (EPA) was established directly under the State Council shortly after the 1972 Stockholm Conference on Human Environment. For over a decade, China's EPA has evolved from its initial function as a coordinating body into an environmental monitoring system primarily devoted to law enforcement, with a network of over 1 400 monitoring stations distributed throughout the country, mostly concentrated in densely populated and highly polluted cities. At the top level, the national General Station is responsible for compiling annual National Environmental Quality Reports from the annual provincial environmental quality reports written on the basis of data collected by local stations in cities, prefectures, towns, etc.

Several measures have been taken to insure the accuracy and reliability of the environmental data taken at the local level:

- standardization of analytical procedures and compilation by the General Station of procedures for routine analyses
- checking in-house control of analyses against standard reference charts and against control samples issued by provincial stations
- provision of reference materials by authoritative organizations such as the National Academy of Metrology

One of the fundamental bases for reliable environmental monitoring lies in the provision and compilation of reliable data, as witnessed by the following progress in China's EPA activities:

- organization of a 50 000-men contingent, distributed among 1 400 stations engaged in ambient environmental monitoring and industrial pollution-source monitoring
- establishment of a management system for quality control and quality assurance of environmental data
- annual reports on the status of the nation's pollution and prediction of future trends
- analysis of pollution by scanning method with the determination of the main pollutants.

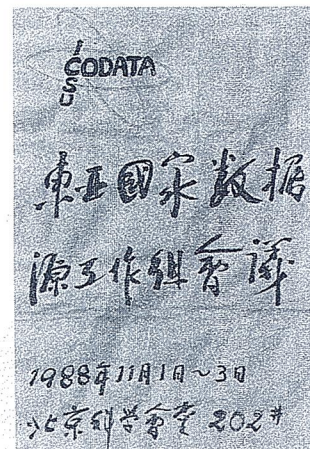
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TASK GROUP MEETING ON EAST-ASIAN DATA-BASES IN BEIJING

The second meeting of the CODATA Task Group on East-Asian Data Sources (subsequent to the Fall 1987 meeting in Tokyo) was held in the Beijing Science Hall in the People's Republic of China, 1-3 November 1988. The Task Group members were augmented by other participants so that in all about 40 scientists participated in some sessions. The Chairman, Professor J. Osugi, was unable to be present but was represented by his secretary Sachiko Yamaguichi and other members of the Japanese delegation.

After the welcoming address by Prof. Juo Baichang, Vice Chairman of the Chinese National Committee for CODATA--which hosted this meeting--Professor Kazuo Takayanagi introduced the activities of the predecessor Working Group and summarized the procedures for the soliciting of entries of the *Directory of East-Asian Data Sources*.

A series of about 20 presentations were made summarizing from each of the three countries represented--China, Japan, and Korea--the recent trends and near-future prospects of chemical, spectroscopic, nuclear, geoscience, aeronautical, materials, and other databases. These included information



Participants at the Beijing Science Hall meeting of the Task Group.

on areas of topics of special interest and/or concern to science and technology in East-Asia. (Note, for examples, the discussion on Chinese databases elsewhere in this issue.) Prof. Xu Zhihong emphasized the relevance and barriers to exchange of data even within China occasioned by software, copyright, and instrumental problems. Purchase and procurement of foreign data bank materials and appropriate charging and reimbursement procedures were also considered. The introduction of artificial intelligence techniques is also underway.

Professor Mitsuo Tasumi's discussion of spectroscopic databases in Japan heralded three important problems occurring in constructing and maintaining spectral databases:

- Funding: Not only the shortage in the support level itself but the discontinuation of financial support--which has often occurred when the project passed the stage of research and testing--has been giving us difficulties in constructing large-scale databases.
- Competition with commercial databases.

- Loss of interest of researchers and producers. The work on developing databases is not evaluated as *research* work. As a result ambitious researchers tend to avoid such work.

In the ensuing discussion, it was observed that lack of interest was a common problem. Conviction of the absolute necessity of the database for their own research was crucial for continuing construction of databases.

Scientific tours to the Institute of Chemical Metallurgy (CAS), the Environmental Monitoring Center for the Beijing Area, the University of Geosciences of China, and other sites gave the participants an opportunity to see demonstrations of database accessing and the logging and handling of data in practical situations. Ms. Dong Qian demonstrated the CODATA Referral Database.

The Task Group deliberations in special session focused on such topics as the importance of critical evaluation in database production, the omnipresent problem of financing with governmental and industrial support, scientist exchange between East-Asian countries, etc. Another facet concerns the future activities of the Task Group. Since the compilation of the *Directory* is almost completed, activities will be transferred to its updating. Another item will be the translation of data publications in East-Asian languages into English. How should the *Directory* be updated? How should the tasks be extended to other countries such as India, Taiwan, Hong Kong, Singapore, Thailand, and possibly Australia and New Zealand? Near- or middle-eastern countries should not be included. Funding will be the major factor of success in these activities. It was agreed that the next meeting of the Task Group would be held in Japan (most likely in Kyoto or Tokyo) in autumn, 1989, and the subsequent one in Seoul in 1990.

Finally, it should be noted that the *East-Asian Directory of Data Sources for Science and Technology* will be published as a *CODATA Bulletin* in early 1989 and the summary presentations made during the meeting will probably be disseminated as a *CODATA Special Report* in early 1989.

Chinese Databases

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From the above activities, the following tasks have been identified for the future: environmental db; biological monitoring, especially residue analysis; ecological monitoring; ecological observation stations in areas of conservation of nature.

BOTANICAL SPECIMENS

China is rich in botanical resources, numbering about 30 000 species of mosses, ferns, and seed plants, most of which have been collected and preserved in the herbarium of the Institute of Botany, CAS, which is the largest herbarium in China, and also one of the largest in Asia, with about 1 500 000 specimens, most of which are of Chinese origin. Each specimen carries a label bearing pertinent data on locality, elevation, habitat, local name, collector's name, field number, data of collection, economic uses, phenology, smell, color, etc. Most of the specimens in this herbarium have been identified on the basis of the *Flora of China*, quite a few volumes of which have already been published. This background provides a favorable condition for setting up a computer db, especially for the purpose of utilizing the economic plants, such as the traditional Chinese medical plants, used efficiently for ages for curing the sick in China, but only to have attracted worldwide attention in recent years. Furthermore, East Asia, particularly southwestern China, is considered to be not covered by glaciers during the Quaternary, thus resulting in the existence of many rare and ancient plants such as Ginkgo, Metasequoia, and Cathaya, which, widely distributed in the Northern Hemisphere during the Quaternary, are now essentially extinct in the other parts of the world. This, too, indicates the significance and necessity of making the information available to the world from a computer database. However, only initial steps have been taken in establishing this.

RARE EARTHS

China ranks first among all countries in rare earth resources. Research and development over three decades have been distributed in at least two research institutes in the Ministry of Metallurgical Industry, seven institutes in the CAS, seven universities, plus laboratories belonging to local governments and industrial enterprises.

The Changchun Institute of Applied Chemistry, CAS, as a main working unit on rare earths, has made the following contributions:

- chemistry of rare-earth elements and rare-earth functional materials, with spectra of the pure elements
- separation and purification of rare-earth elements by chemical complexing
- solvent extraction of rare-earths and mathematical simulation of the extraction processes, including the compositions and properties of the aqueous and nonaqueous phases containing the rare-earth coordination compounds

- synthesis and reaction mechanism of solid rare-earth compounds, e.g., single crystals and polycrystalline rare-earth functional materials
- physico-chemical properties and electrode processes for fused rare-earth chlorides and fluorides
- inorganic analytical chemistry for trace components
- synthesis and properties of organo-metallic compounds involving rare-earths and transitional metals.

Such accumulation of China's own work in the chemistry, separation, analysis, and compounds and materials, involving rare earths, in addition to extant literature, are being organized by the Changchun Institute of Applied Chemistry into a database involving rare earth: solvent extraction, physical and chemical properties, spectra--such as NMR, IR, MS, etc.--and functional materials.

IN CONCLUSION

As a developing country, China is in a disadvantageous position as to scientific and financial resources in supporting current database activities. But, with her unique resources, coupled with the non-traditional ways in which these need to be utilized in the context of the special socio-economic background of China, the existing research institutes may well constitute a potential wealth of fresh data contributions.

Such shortcomings and potentialities have prompted SDB organizers in China to propose the following guidelines for the next five years:

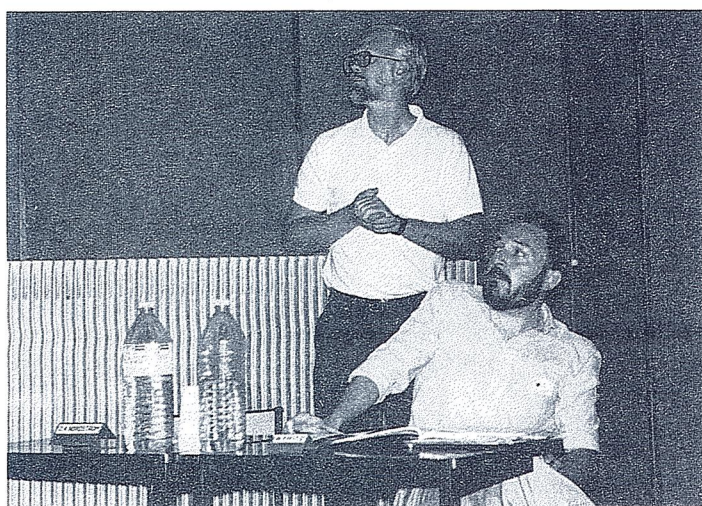
- a high-priority support of the four SDB working groups already organized and the two being organized
- special support to SDB with Chinese uniqueness, e.g., biological resources, earth sciences, rare-earths, Chinese soils, and native medicine
- prompt use of SDB as they are compiled. In addition to more extensive distribution of CODATA directories of data sources, under planning is the compilation of a directory of Chinese data sources
- increased interaction with CODATA and other international bodies, especially in the techniques of data evaluation. Domestically, this calls for the organization of China's data evaluation bodies, and internationally, for extensive participation in meetings on SDB, training of personnel in well established SDB institutions, as well as initiation of cooperative research.

Further developments are heralded in a CODATA *Special Report* covering presentations on similar developments in China. These presentations were made at the November 1988 meeting of the East-Asian Data Sources Task Group and will probably be available in early 1989.

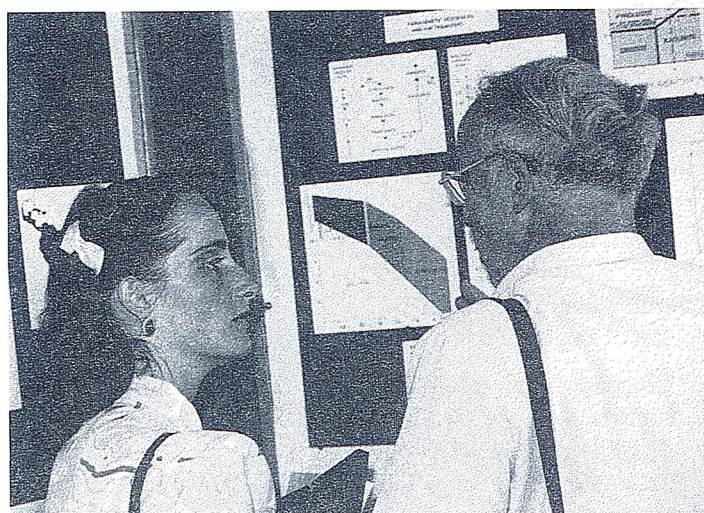
Geothermodynamicists Meet in Strasbourg

Nearly 100 participants in the Symposium on the Thermodynamics of Natural Processes (TNP1) met in Strasbourg, France, in late July 1988. The CODATA and geologically sponsored meeting in late July was broadly international in scope (France, FGR, USA, USSR, and others) and discussed thermodynamic applications ranging from hydrocarbon solubilities and transport in brines to the formation of travertine dams. During the course of the meeting the CODATA Task Group on Geothermodynamics Tables presented for review the draft typescript of its Guidelines for Geothermodynamics Tables in a special section. This was the first forum for peer comment on the CODATA Geothermodynamics Guidelines.

The organization--to the credit of Prof. Bertrand Fritz--was excellent in all respects. The meeting was designated the "R.M. Garrels Symposium" in honor of Prof. R. M. Garrels, the recently deceased Honorary Chairman.



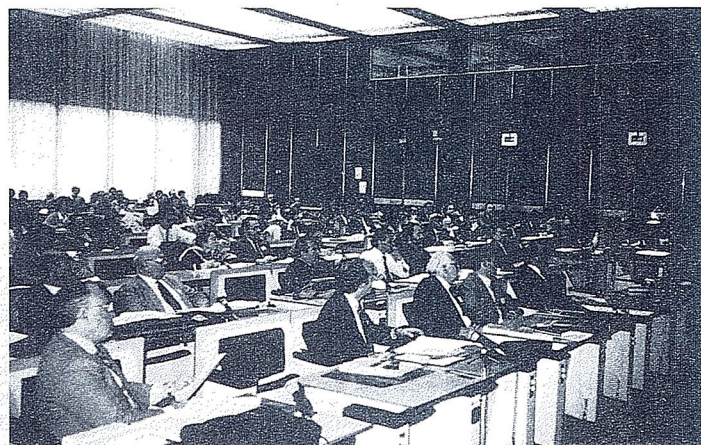
Session Co-Chairmen D.K. Nordstrom (standing) and B. Fritz share the anguish of operational decisions of keeping the meeting on track.



Sylvie Parc (Aix-Marseilles) and German Kolonin (Novosibirsk) discuss her poster on phase behavior.

Use and Standardization of Materials Data Banks

CODATA France Day--a study day on *Materials Data Banks: Their Use and Standardization*--involved 150 data bank producers and users from France, F.R.G., the Netherlands, and U.K. in Paris on 8 November 1988. Materials Data Banks in Europe and North America were covered by guests including Gil Kaufman (MPD, U.S.A.), Norman Swindells (MATSEL Systems), Keith Reynard (Wilkinson Consultancy Services, U.K.), P. Büttner (FIZ-W, F.R.G.) and W. Rauls (DIN, F.R.G.).



The full day program, hosted by CODATA France, DBMIST/MENJS, AFNOR, FLA Consultants, and Magetex, stressed the need for greater standardization among the materials data bank producers. The first results of the CEC Materials Data Bank Demonstration Program were discussed. Proceedings of the meeting will be published by *Materiaux et Techniques* early in 1989.

CODATA Calendar

1989

February

- 7-8 Scientific Program Committee, 12th Int. CODATA Conference, Paris, France
- 8 CODATA Publications Committee, Paris, France
- 9-11 CODATA Executive Committee

April

- 10-12 Chemical Thermodynamic Tables, Washington, D.C.

1990

July

- 15-21 12th International CODATA Conference, "Data for Discovery," Columbus, Ohio, U.S.A.
- 22-23 CODATA General Assembly, Columbus, Ohio, U.S.A.

CODATA Publications

Materials Data Banks: Abstracts of a CODATA France Symposium, CODATA Bulletin, No. 67, December 1987. (a)

Abstracts from the 11th International CODATA Conference, CODATA Bulletin, No. 68, August 1988. (b)

Guide to Material Property Database Management, CODATA Bulletin, No. 69, November 1988. (c)

Books

International Thermodynamic Tables of the Fluid State, Volume 10, edited by K.M. de Reuck, S. Angus, W.A. Cole, R. J.B. Craven, and W.A. Wakeham. (d)

Solubility data series, Vol. 27/28: Methane, edited by H.L. Clever and C.L. Young. (e)

Solubility data series, Vol 29: Mercury in liquids, compressed gases, molten salts and other elements, edited by H.L. Clever. (f)

Solubility data series, Vol 30: Alkali metal halates, ammonium iodate and iodic acid, edited by H. Miyamoto and M. Salomon. (g)

Handbook of Heats of Mixing. Supplementary Volume, by J.J. Christensen, R.W. Hanks, and R.M. Izatt. (h)

Mineralogical Compound Thermodynamic Data Handbook, by Lin Chuan Xian. (i)

Building Databases for Global Science, edited by Helen Mounsey and Roger Tomlinson. (j)

(a) CODATA Bulletin. i + 39 pp. Available Pergamon Press, Ltd., Headington Hill Hall, Oxford, U.K., OX3 0BW.

(b) CODATA, 1988. x + 58 pp. Available North America, Hemisphere Publishing Corp. ISSN 0336-757x.

(c) CODATA, 1988. x + 58 pp. Available North America, Hemisphere Publishing Corp. ISSN -336-757x.

(d) The major part of this book consists of tables of the equilibrium thermodynamic properties of ethylene for both the gas and liquid phases and along the saturation and the melting curves. The limits of the tables are 104K to 320K for pressures up to 279MPa and 320K to 450K for pressures up to 40MPa. The properties listed are volume, entropy, enthalpy, isobaric heat capacity, compression factor, fugacity-pressure ratio, Joule-Thomson coefficient, ratio of heat capacities and speed of sound as functions of pressure and temperature, and pressure entropy, internal energy and isochoric heat capacity as functions of density and tem-

perature. The text gives a critical assessment of the accuracy of all the available experimental data and gives comparisons of the tables with the experimental data. Blackwell, July 1988. Reference. 272 pages, mainly tables; 39 illustrations. About £32.00. 0 632 01709 0.

(e) Oxford: Pergamon Press, Ltd., Headington Hill Hall, Oxford, UK, OX3 0BW, 1987. 783 pages. £160.00. ISBN 0 08 029200 3.

(f) Oxford: Pergamon Press, Ltd., Headington Hill Hall, Oxford, UK, OX3 0BW, 1987. 255 pages. £80.00 ISBN 0 08 035935 3.

(g) Oxford: Pergamon Press, Ltd., Headington Hill Hall, Oxford, UK, OX3 0BW, 1987. 510 pages. £120.00 ISBN 0 08 029210 0.

(h) A continuation of the 1982 Handbook of Heats of Mixing, the Supplement summarizes the published literature values through 1980 for the mixing of liquids, and contains enthalpy changes for the mixing (ΔH) of pure

liquids and gases at a constant temperature and pressure. 1988. 1,168 pages. \$150.00 1-62426-8.

(i) Beijing: Scientific Publications. 2900 boards, 2000 pages.

(j) The book is a collection of papers given by an invited audience of renowned scientists at the first meeting of the Global Databases Planning Project at Tylney Hall, Hampshire, U.K. in May 1988. It is a summary of the current work of the national and international agencies responsible for environmental monitoring and modelling. It examines the philosophical, methodological, technical, legal and organizational problems associated with running these databases; defines the shortcomings and advantages of selected data sources, and presents an overview of future developments. Alastair Hirst, Taylor & Francis Ltd, Rankine Road, Basingstoke, Hants, RG24 0PR U.K. (Tel: 0256 840366). 1 August 1988. 434 pages. £35.00 ISBN 0 85066 485 3.

Selby Angus

(continued from page 5)

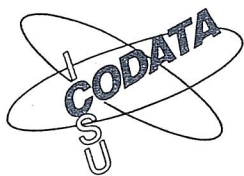
Representative from 1985. From 1982 he was the Liaison Officer with the European Federation of Chemical Engineering on behalf of the IUPAC Division of Physical Chemistry. He also served on the Advisory Board of the Journal of Chemical Thermodynamics.

It was Selby's idea to turn an informal gathering of researchers at Idaho in 1978 into a series of International Workshops on Equations of State. This successful series has since made major contributions to the development of the subject, and on his retirement from the 4th Workshop in 1986, again in Idaho, Selby was presented with a commemorative plaque.

Outside the world of thermodynamics Selby read extensively and was knowledgeable on many subjects. Conversation with him was always interesting and enjoyable and it was unusual if one did not learn something new. His many interests covered the English language, art, music, and the theatre--and more recently--genealogy. He had much pleasure in researching the history of his and his wife's families, both of which had their roots in the north-east of England.

His many publications will remain as a memorial to his contributions to the field of thermodynamics and in particular to the subject of equations of state of pure fluids, but to those who knew him, Selby will be remembered for his great kindness, gentleness and friendship, and those are the qualities which made it such a pleasure to work with him.

-- K. M. de Reuck



Task Group on Materials Database Management

Materials Database Newsletter

January 1989, Number 6

The CODATA Task group on Materials Database Management held its 4th Meeting on 28 September 1988, during the 11th International CODATA conference in Karlsruhe. The Group now comprises members and corresponding members from 10 different countries.

The recently completed *Guide to Materials Database Management* is being made available as *CODATA Bulletin No. 69*. It provides guidance on the steps necessary to ensure the quality and reliability of machine-readable sources, ease of use and responsiveness to users' needs and expectations. Further details will be announced in the next issue of this Newsletter. The recent meeting made further progress in the assessment of the benefits of materials property databases and their economic consequences; structured lists of such benefits are being prepared. The Group's international register of materials database managers is now in being and will be regularly updated. Among new business items discussed were the management problems of database delivery.

STANDARDS

VAMAS Technical working area 10, Materials Databanks, has issued a short communique following the VAMAS Workshop on Standards for Materials Databanks which was held in Petten, The Netherlands, 15-17 November 1988. The workshop defined the next steps that must be taken by the materials community to ensure that the materials databases and information networks currently being built will effectively serve design engineers, manufacturing/process engineers, materials R&D people and materials producers; and at the same time ensure that the work being done worldwide on materials databases is both non-redundant and achieves portability between organizations. Action steps were identified in some standardization and pre-standardization areas where particular needs exist: Materials Identification; Terminology Harmonization; Data Interchange; Data Reporting Formats; and Models for Data Evaluation and Analysis.

The specific recommendations are addressed to the International Standards Organization (ISO), to national standards organizations, to individual professional societies, to the CEC and to VAMAS itself. The Workshop was convened under the auspices of VAMAS (Versailles Project on Advanced Materials and Standards) representing the techno-economic interests of Canada, France, F.R. Germany, Italy, Japan, UK and the CEC. The 45 participants from 13 countries were drawn from three different technical communities: standards organizations, engineering bodies, and materials information groups.

ASTM Committee E49 on Computerization of Material Property Data met in Toronto, Canada in October and advanced six recommended standard formats for reporting test results and three generic guidelines for the description of materials to balloting of the entire Committee. The materials classes covered included metals, polymers, ceramics, and composites, and the test types included tension, compression, bearing, notched bar impact, and plane-strain fracture toughness. Significant studies were also begun on the search for standards related to data quality and reliability. International participation in these activities is strongly sought; interested parties should contact: Don Viall, ASTM, 1916 Race Street, Philadelphia, PA 19103, USA (Tel +44 1 215 299 5546).

CALENDAR

27-29 June 1989: St. Louis, MO, USA

ASTM Committee E49 on COMPUTERIZATION OF MATERIAL PROPERTY DATA MEETING.

(continued from preceding page)

27-29 November 1989: Orlando, FL, USA*

Technical Committee Meetings of ASTM Committee E49 on COMPUTERIZATION OF MATERIAL PROPERTY DATA.

29 November - 1 December 1989: Orlando, FL, USA*

Second International Symposium on COMPUTERIZATION OF MATERIALS PROPERTY DATA.

** Please note amended dates for both of these events.*

15-19 July 1990: Columbus, OH, USA

Twelfth (Biennial) CODATA INTERNATIONAL CONFERENCE, DATA FOR DISCOVERY.
CONTACT: 12th CODATA Conference, "Data for Discovery," Applied Information Technologies Institute, 1880 Mackenzie Drive, Suite 111, Columbus, OH 43220, USA.

EDITOR: W. G. Jackson. EDITORIAL OFFICE: The Institute of Metals, 1 Carlton House Terrace, London, UK, SW1Y 5DB. Tel: +44 1 839 2289. Telex: 8814813. Telefax: +44 1 839 2289. There are no restrictions on the reproduction and distribution of the contents of this Newsletter.

Editor pro tempore: Edgar F. Westrum, Jr.

Department of Chemistry, University of Michigan,

Ann Arbor, MI 48109

Telephone: (313) 764-7357 / Telex: 8102236056

FAX: 1-313-747-4865

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CODATA Secretariat, 51 Blvd. de Montmorency,

75016 Paris, France

Telephone: 33 1 45250496 / Telex: 630553

FAX: +33 1 42889431 / Cables: ICSU Paris 016

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CODATA, 51 bd. de Montmorency, 75016 Paris