

CODATA

This article is based on the text presented by B. Vodar, President of CODATA, to the IUPAP General Assembly in Washington in September 1972. Essentially, it describes the relevance of CODATA to the field of physics and to the work of physicists.

Quantitative information is a central core of scientific knowledge. It is the most condensed and immediately useful form of scientific information available to the users. It thus shares, with economics, an essential role in engineering which shapes the material progress of society. This is why, apart from scientific reasons, data need to be reliable and internationally acceptable.

In 1966, ICSU established the Committee on Data for Science and Technology, CODATA. The justification for such a Committee attached to ICSU is probably that, whereas data are part of all sciences, the systematic preoccupation with supplying the best possible data is not. Another reason is that there are multidisciplinary interests, such as: a) evaluation of concepts and methods for quality control of data; b) definition of user needs, especially when data sources and users are in different fields of science; c) standardization of quantitative data information, such as fundamental constants, recommended units and conventions; d) information technology; e) a clearinghouse for data publications; f) organization of conferences for interested groups.

Initially the scope of CODATA was defined as, essentially, physics and chemistry only. In 1971, it was extended to geo- and bio-sciences, and now it covers all quantitative data, with emphasis on quality control by *a priori* or *a posteriori* evaluation.

CODATA works through its Central Office for co-ordination, information exchange and for its publications: the *Compendium of Numerical Data Projects*, the *Newsletter* and the *Bulletin* (freely available on request from the Central Office, 19 Westendstrasse, Frankfurt/Main, Fed. Rep. of Germany).

Task Groups

Scientific work is done by the CODATA Task Groups:

Fundamental Physical Constants. A consistent set of 25 fundamental phys-

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sical constants has been recommended for international use and will be published in *CODATA Bulletin*.

Key Values for Thermodynamics. A Final Set — Part I was published in *CODATA Bulletin 5* and Tentative Sets — Parts II and III in *CODATA Bulletins 6* and *7*. Such sets of key values allow us to envisage the preparation of a single internationally accepted series of Tables of Thermodynamic Data.

Data for Chemical Kinetics. A report entitled 'A Catalog of Compilation and Data Evaluation Activities in Chemical Kinetics, Photochemistry and Radiation Chemistry' was published in *CODATA Bulletin 3*.

Transport Properties. Established in June 1972.

Environmental Data. This *ad hoc* Task Group was established in June 1972.

WFEO-CEI/CODATA Joint Working Group on Engineering Data. This joint activity with the Committee on Engineering Information of the World Federation of Engineering Organizations held its first meeting in June 1972.

Computer Use. This group published the 2nd ed. of 'Automated Information Handling in Data Centres' in *CODATA Bulletin 4* and will organize an International Symposium in July 1973 on 'Man-Machine Communication for Scientific Data Handling' in Freiburg, Fed. Rep. of Germany.

Publication of Data in the Primary Literature. The Task Group met in June 1972 and a 'Draft Guide for Publication of Data in the Primary Literature' has been prepared.

Accessibility and Dissemination of Data. Established in June 1972.

ICSU Abstracting Board/CODATA Joint Working Group on the Relation between Abstract and Indexing Services and Data Centres. Established in June 1972.

CODATA seeks to decentralize its activities by involving the scientific community as much as possible; this trend is necessary for both scientific and financial reasons. CODATA has established Area Task Groups; when data generation and use lie predominantly within a single field of science, or an established Inter-Union Commission, or an ICSU Committee, responsibility should be shared with the body concerned, although CODATA could play a co-ordination role.

Possible role for IUPAP

CODATA is composed of Member International Scientific Unions (10) and national committees of Member countries (15). A greater involvement of the Scientific Unions is highly desirable, since reliable data are those which have been accepted by the international community of experts. Each national delegate is requested to avail himself of advisory help within his country and this has led to the formation of national committees for CODATA, which can share responsibilities for data projects. Whether one should attempt to achieve similar results regarding the Unions is a question which is being discussed with IUPAP because of the multidisciplinary and industrial importance of physics data.

The modes of collaboration for physicists could be: a) establishment of a CODATA group or sub-commission; b) selection of delegate to CODATA with a broad knowledge of IUPAP and able to achieve co-ordination at a sufficiently high level; c) discussions on CODATA at the IUPAP General Assemblies; d) setting up of new Area Task Groups with a partial financial contribution from CODATA; e) IUPAP participation in some of the Area Task Groups set up or being up by CODATA, with hopefully, a partial support from IUPAP; f) establishment of Inter-Union Area Task Groups, with a contribution and the co-ordination supplied by CODATA; g) planning, at the scientific conferences sponsored by IUPAP, sessions for discussions on data and methods for their improvement (this suggestion applies possibly mainly to the topical conference and the general conference of IUPAP; as an example, one can note the conference which will be organized by the new Commission on Molecular and Atomic Physics). Regarding scientific areas of possible interest for IUPAP, one can mention that CODATA is setting up a Task Group on Transport Properties (of solids), but that there is presently no involvement of CODATA in other areas of solid state physics, plasmas, or spectroscopy, including spectral line shapes. An initial objective would be to determine areas of at least partial interest for IUPAP, in which work should be and could be done. CODATA would be willing to provide co-ordination with other Unions or bodies to those groups or persons within IUPAP who would undertake this work.

One might also speculate briefly on a difficult but important point: whether

Im Fachbereich Physik der Universität Frankfurt ist eine

H3 - Professur für Theoretische Physik

wiederzubesetzen.

Das Aufgabengebiet ist Festkörperphysik. Von den Bewerbern wird die Bereitschaft zur Zusammenarbeit mit dem Sonderforschungsbereich « Festkörperspektroskopie » Darmstadt/ Frankfurt sowie ein engagierter Einsatz in der Lehre erwartet.

Bewerbungen mit Lebenslauf, Schriftenverzeichnis und Angaben über die bisherige Forschungs- und Lehrtätigkeit werden bis zum **15 März 1973** erbeten an den *Präsidenten der Johann Wolfgang Goethe-Universität, D-6000 Frankfurt am Main 1, Senckenberganlage.*

ciety could play a leading role in stimulating a regional development of national efforts.

Conclusion

Data, for the scientist or the engineer, represent an important part of his daily 'environment'.

Part of this 'environment' has been degraded in the same way as in other environmental problems — by excessive disordered growth and by the neglect of sponsoring bodies and of scientists themselves. By such neglect, the efficiency of research or development work has been lower and work more difficult than necessary. It is time that, as in other fields of environmental nuisance, one became conscious of an urgent need to improve the situation by promoting and sponsoring co-operative efforts.

Data play a well-identifiable and a most concrete part in the social role of science.

Moreover, of all the various forms of creative production, either intellectual or artistic, science communicates with particularly great difficulty with the 'outside' world. Data are one important output of science to the 'outside', and for that reason data problems are worth of very serious consideration.

and how IUPAP, possibly through its specialized groups dealing with CODATA, could act as referee for an evaluation of data projects and compilations? This and other means of quality control of data are essential, since they lead to a compression of the literature of data compilation.

CODATA and European physics

So far, the use of physics data for applied physics, engineering and other sciences has been stressed. In addition, one should emphasize that physicists have responsibility for the quality and accessibility of physics data.

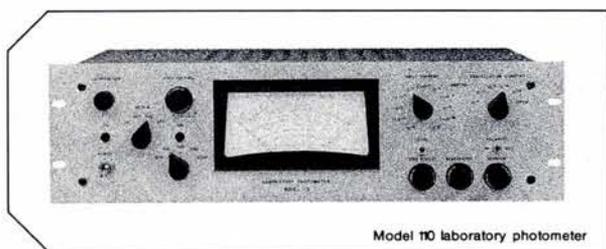
It is in physics and chemistry that the concepts for critical evaluation of accuracy have been developed, while they are slowly being adapted to other sciences. Accurate data continue to play an essential role in these disci-

plines, particularly in physics. This is sometimes neglected today in our world of hard and fast competition.

Compilations of reliable and evaluated data depend on data centres, each dealing with a rather narrow field of science and closely connected with specialized laboratories. Therefore, as in other problems of science, whereas the International Scientific Unions, such as IUPAP, ensure co-ordination, the effective work is to be done, and financed, by national or regional efforts. Hopefully, in Europe, it will be possible to develop joint, regional programmes in data production, collection and evaluation, and in publication and dissemination.

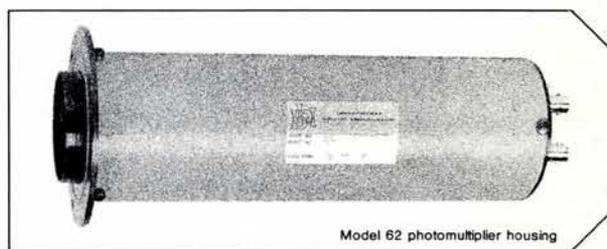
Since, in physics and related sciences, a prompt supply of reliable data is extremely important, the development of such programmes would have a significant impact on European industry. The European Physical So-

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