International Committee on Systematic Bacteriology Subcommittee on Numerical Taxonomy

Minutes of the Meeting, 8 August 1982, Boston, Massachusetts

Minute 1. *Call to order.* The meeting was called to order at 14:00 by the Chairman, P. H. A. Sneath.

Minute 2. *Record of attendance.* In attendance were P. H. A. Sneath (Chairman), V. B. D. Skerman, J. De Ley, L. R. Hill, D. J. Brenner, and R. R. Colwell (Secretary).

Minute 3. *Minutes of the 1980 meeting.* The minutes of the 1980 meeting held in Liblice, Czechoslovakia, were approved as distributed.

Minute 4. *Worldwide data network.* Prospects for a worldwide data network were discussed. L. R. Hill served as the representative of the Subcommittee on Numerical Taxonomy to a round table at the IUMS Congress on the data-networking system.

Minute 5. *Test reproducibility.* Test reproducibility was discussed. It was pointed out that a good deal of work has been done and that a number of publications have ensued. Test reproducibility is an important factor in numerical analyses. One must know what sort of error rate exists in a working laboratory. P. H. A. Sneath pointed out that a 1 to 2% error rate is very good. A 5% error rate is acceptable, but beyond 10 to 15%, the error rate results in merging of groups. Overall, most laboratories run at error rates of about 3 to 6%.

Minute 6. *Matrices.* Development of identification matrices was discussed. It was pointed out that there are a number of matrices now available in the literature. The Subcommittee wishes to foster collaboration in this area with other International Committee on Systematic Bacteriology subcommittees.

Minute 7. *Development of Matrices.* In developing identification matrices, attention should be drawn to the difficulties in preparing matrices due to the inherent problems of intra- and inter-laboratory standardization. It was pointed out that in the numerical analyses of microorganisms to date, the higher-level linkages appear to be stable but the lower-level linkages are less sensitive. In fact, genus and family level linkages are uncertain. If one looks only at species clusters and seeks out a determinative scheme below the species level, linkages are not important. It is necessary to know the groups well before one can develop effective species separations. The principles for constructing identification matrices are not easy to perceive for all groups. Difficulties were pointed out concerning taking data from the literature and from different laboratories and mixing them with newly derived data. P. H. A. Sneath provided a brief discussion of a computer program that is useful in seeking out degrees of overlap.

Minute 8. *Deoxyribonucleic acid homology.* Deoxyribonucleic acid homology studies were discussed by J. De Ley,

who pointed out some dangers of uncritical use of homology methods, especially with regard to the problem of Na⁺ ion concentration. The effects of temperature and salinity were emphasized as being highly significant. The temperature used for data gathering from which one draws taxonomic conclusions should have at least 25°C between the melting temperatures for developing stringency of hybridization. J. De Ley has published a formula for calculating the temperature of optimal reassociation. The necessity for internal controls was emphasized. Too many laboratories select a temperature for performing hybridizations and report results without actually selecting two temperatures and making a comparison.

Minute 9. *Hybridization.* It was also pointed out that the method used for hybridization (for example, whether dimethyl sulfoxide or formaldehyde is added to the system) can have a significant effect on the results. Curves shift up or down or right or left depending on concentrations. Thus, it is important to state carefully what conditions are used for hybridization. It was also noted that, if the S1 nuclease method is used, there can be differences in results between laboratories if a rigid correlation is not established. The problem of mismatching was also discussed. It was pointed out that when hybridization is obtained, it is significant, but when it does not occur, it means nothing. Attention was also drawn to the particular significance of reference strains.

Minute 10. *Protein gel electrophoresis.* Protein gel electrophoresis methods for determining similarities were also discussed. Electropherograms with comparisons by computer appear to provide promising results.

Minute 11. *Collaboration.* Potential areas of interaction with other organizations were discussed. Collaboration and contracts with the World Health Organization, particularly in developing the use of microcomputers in microbiology and rapid diagnosis and training courses were discussed. Collaboration with the World Health Organization, the United Nations Educational, Scientific, and Cultural Organization, and other bodies wishing to collaborate should be encouraged.

Minute 12. *Changes in membership.* New members elected to the Subcommittee were Drs. Schindler (Czechoslovakia), Gunn (United States), and Gutteridge (United Kingdom). V. B. D. Skerman announced his retirement. The members of the Subcommittee expressed their appreciation to V. B. D. Skerman for his dedicated and tireless work on behalf of the Subcommittee on Numerical Taxonomy.

The meeting was adjourned at 17:00 on 8 August.

R. R. COLWELL, *Secretary*