Taxonomic Databases Working Group

for Plant Sciences

(TDWG)

REPORT

of the Second Meeting

at the Hunt Institute for Botanical Documentation, Pittsburgh

16-18 November 1986

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Taxonomic Databases Working Group for Plant Sciences

Report of Second Meeting, Pittsburgh, 16-18 November 1986

Present Members

1	British Museum (Natural History)	D. A. Sutton
2	IUCN (Conservation Monitoring Centre)	H.Synge, D.C. Mackinder
3	Royal Botanic Gardens, Kew	W.D. Clayton
4	Missouri Botanical Garden	R.E. Magill N.R. Morin
5	Smithsonian Inst., Washington	E.R. Farr
6	New York Botanical Garden	N.L. Holmgren
7	ESF European Documentation Syst.	V.H. Heywood (Convenor, in the chair)
8	International Legume Database (ILDIS)	F.A. Bisby (Rapporteur) R. Allkin
9	Cons.et Jardin botaniques, Geneva	H-M. Burdet
10	BIOSIS	M.N. Dadd
11	Berlin (Bot.Gart. und Bot. Mus.) & I.A.P.T.	W. Greuter
12	Hunt Institute, Pittsburgh	R.W. Kiger (Host), T.D. Jacobsen, G.D.R. Bridson
13	Int. Mycological Inst. & CABI	D.L. Hawksworth
14	IUBS & IAPT	J. McNeill
15	Gray Herbarium, Harvard	E.A. Shaw
16	Royal Botanic Garden, Edinburgh	J. Cullen

Observers

1	MABII/UNESCO, Washington	F. Gomez-Dallmeier
2	Fl. Veracruz, INIREB, Jalapa	T. Duncan (Univ. of California)
3	Carnegie Museum, Pittsburgh	F.H. Utech
4	Ctr. Plant Conserv., Arnold Arb.	K.S. Walter
5	Flora of Ecuador, Aarhus	P.Frost-Olsen
6	USDA, Beltsville	D. Farr

Apologies

Botanical Survey of India	(M.P. Nayar)
PRECIS, Pretoria	(G.E. Gibbs Russell)
U.S. Nature Conservancy	(L.E. Morse)
Colombian Nat. Herb., Bogota	(E. Forero)
Reseau Floristique Suisse	(J-M. Mascherpa)

Taxonomic Databases Working Group (Pittsburgh, 1986)

Session 1 Data-handling I - 17 Nov., a.m.

Introductory remarks. Heywood, the chairman, welcomed new participants. He outlined the purpose of the Working Group in establishing a basis for international co-operation between taxonomic databases, and as a forum for discussing designs and standards.

Welcome by Kiger, Director of the Host Institution, the Hunt Institute for Botanical Documentation.

The chairman reminded participants that a large element of the business was to receive reports or recommendations from those who had agreed to pursue particular activities at the first meeting (referred to as TDWG 1).

1.1 Name-authors (the so-called "authorities", authors of new names - see TDWG 1)

Clayton reported that Brummitt's work at K was progressing well, and that a new list of name-authors and recommended abbreviations would be published by K in a year or so. There was some uncertainty as to the exact title. The list was based on wide consultation and would contain a clear statement of the principles used. Much concern was going into the use of diacritics and names from other alphabets.

Heywood drew attention to the previous recommendation (TDWG 1, 21(i)) that a mechanism for wider international participation be considered. Clayton thought K would not be interested in any external supervision, but might submit the list for approval, perhaps by IAPT. Greuter thought that discussion and approval would be appropriate, not by TDWG which is not established, but by the General Committee of IAPT.

Bisby asked whether recommendations 2.1 (ii), (iii) and (iv) had been accepted at K - that the list would have a clearly defined field format, that the process of updating become a continuous process, and that the list be made available on machine-readable medium. Clayton was uncertain but thought these presented little problem in principle.

There was discussion about the overlaps between both the abbreviations and the people involved in authoring names of fungi, bryophytes and angiosperms. It was thought that as the lists became longer the chances of avoiding overlapping abbreviations would become small, and consequently this should not be attempted. It was also recognised that there may be many occasions when it is not sensible to abbreviate, but the various lists (the lists for seed plants and for pteridophytes from K, the IMI system for fungi, the MO system for bryophytes) are of tremendous value even to those who do not abbreviate.

1.2 Journal titles

Kiger reported that the Hunt Institute would publish a supplement to Botanico-Periodicum-Huntianum (henceforward referred to as BPH-2) in 1987. Bridson said that it would contain 10,300 new and revised journal titles (about 3,000 new titles), a new index to the complete set of titles (those in BPH and BPH-2), and an index to individual words and their abbreviations. The principles used would be clearly laid out, and are the same as those used in BPH. Diacritics are carefully recorded. It is presently in word-processor form but the plan is to turn this into a database. The principle of wider international consultation is welcomed and a copy of the word index is about to be circulated.

Greuter asked about a continuing mechanism for additions, even a system of registration. Kiger thought the Hunt would certainly continue the work and with a possibility of producing lists in machine-readable form in the future. Bridson said that at present most new titles are located in library catalogue systems but the idea of looking at issn registrations (TDWG 1 2.2(iii)) was a good one.

Farr (USDA) pointed out that the Am. Mycological Soc. does not accept BPH as its standard. Dadd asked whether abbreviations are such a good idea anyway, and also expressed concern at the use of divergent systems. Many organisations, including BIOSIS, use the ISO system. Hawkesworth asked if BPH could improve the coverage of mycological journals.

1.3 Book titles

Magill reported for Crosby that TL-2 provides a standard and guidelines. The last volume will contain a massive index. Machine-readable tapes are available for the later volumes, and the complete material may be made into a database. The standard includes full title, short title and abbreviated short title.

Burdet reported that the MedChecklist project has a system for checking book title abbreviations for inconsistencies. Greuter expressed concern that TL-2 was extremely incomplete in the early volumes, and that to use it one may have to look in all 7 volumes. He would support an effort to produce a compact unified list of abbreviations.

Dadd reminded the meeting that BIOSOS do not abbreviate book titles. There was a general response that in many taxonomic contexts, such as listing synonymies, it was unacceptable to list all book titles in full.

Agreed: representatives from G, MO and NY invited to form a consultative group to report back to the next TDWG meeting with proposals for a compact unified list of abbreviations. (Crosby invited to convene).

1.4 Geography

Mackinder reported on his progress with trying to devise a geographical system that might be widely used among the databases of TDWG members.

The majority of botanical taxonomic systems will need to include geography. In his view the choice was between a relatively crude simple system that approximated to the resolution of data presently given in Floras, and a full scale GIS (geographical information system) requiring much more precise site data plus a heavy committment to software and hardware. He had worked on preparing a standardised simple system which if adopted by several databases would permit data exchange.

He had encountered three problems

1) Continents and Regions. The definition of these is very variable, and he suggests that each system will continue to go its own way. The proposed standard does not list continents or regions.

2) Countries. These present very many problems - disputed areas, changed boundaries, physically distant parts (Hawaii in USA, etc.), nations often included in others (Vatican City in Italy, etc.), and nations straddling continents (e.g. Turkey in Europe, Turkey in Asia).

3) Desire to accept only some subdivisions. To clarify the political and biogeographical distinctions there is a need to "name" the remainder of a nation after acceptance of only physically separate subdivisions. (e.g. to subdivide USA into the states Hawaii, Alaska and "contiguous USA", or to subdivide Spain into the province Canaries and "mainland Spain").

Mackinder circulated a Draft Geographical Classification (Paper 1) for discussion. It uses as its highest level countries recognised by the International Standards Organisation (those recognised at the U.N.) Using these removes the onus of making political decisions. To work as a standard we should have to accept all of the "ISO-Countries" - the list does include some quirks. It also means giving separate records (or none) for nations often included in others.

It is at the next level down, the subdivisions of ISO-countries, that the difficulties arise. Mackinder presently lists all of the administrative subdivisions (e.g. all states of the USA) but is considering the idea of "named remainders" (e.g. contiguous USA).

There may also be advantages in using a free text expression for "soft-edged" areas in addition to a precise classification of "hard-edged" areas (e.g. "Rocky Mountains", "Northern France").

McNeill asked whether these problems had not already been addressed by geographers, economists etc?. He also thought data should be kept in the original form in which it is provided. Shouldn't all records be translated to a grid system? Despite these doubts, there was wide support for the initiative taken by Mackinder/IUCN.

Agreed 1) to recognise the extent and importance of the problem and to support Mackinder/IUCN in seeking assistance and funds for further work on his system.

Agreed 2) to allow time for detailed discussion at the next TDWG meeting when members had had time to consider the Draft Geographical System and to send comments to Mackinder.

Session 2: Data-handling II - 17 Nov. a.m.

2.1 Family names

Magill reported that MO has a computer list of approx. 4,000 family names (including fungi) with kingdom, class and source noted against each. Hawksworth said that IMI was producing a full list of families of fungi as part of the Index of Fungi.

There was discussion about abbreviations. It seems too troublesome to produce unique abbreviations to cover all groups (especially where families starting Pseudo-, Eu-, Phyto- are frequent). Agreed: that separate exercises (e.g. for seed plants, pteridophytes, bryophytes, fungi) may prove worthwhile, if only by cutting the -aceae suffix to shorten printed tabulations.

2.2 Generic names

Clayton reported that the K herbarium Generic List (see "Computers & Databases at Kew", Paper 2) is running now as a database and undergoing final editing prior to publication. It includes all c14,000 genera recognised in the Kew herbarium with name-authors and synonyms for certain families. Clayton thought that K would welcome contributions from specialists and specialist projects. E. Farr (Smithsonian) reported that ING has 60,000 names in machine-readable form and would welcome corrections to family membership of the accepted genera. Hawksworth reported that the Index of Fungi is available on-line and allows one to look up generic names and synonyms. Bisby reported that Dr. A. Shmida at the Hebrew University, Jerusalem has a computerised listing based on Willis's "Dictionary of Flowering Plants and Ferns".

There was support for the view of McNeill that it was easier to put generic names into a kind of synonymy if one started from an existing set of names such as ING. Greuter and McNeill stressed the need for all systems to treat mis-applied names correctly so that they did not create "false synonymies".

Agreed 1): that there is a need for a complete generic listing system

Agreed 2): to invite ING, K, MO, the Hunt Inst., Duncan and Dr. Shmida to collaborate in planning such a system (E. Farr asked to convene).

2.3 Species Names

Holmgren raised the need for an index of lectotypification. A paper circulated by Sutton "Summary of botanical databases at the BMNH" (Paper 3) contained some information on the joint BMNH/Linnean Society project for a database of lectotypifications of Linnaean names.

2.4 Name lengths

Synge circulated the results of his survey "The Length of Plant Names" (Paper 4) based on samples of about 6,000 genera and 75,000 species. He suggested adoption of the following lengths for seed plants, if members were putting fixed lengths to records or to screen formats.

Genus - 22 letters
Species - 22 letters
Subspecies and Variety - 22 letters (an example of 25 is known)

He recommended that if longer names were to occur, truncation should be used and not abbreviation.

Farr (USDA) thought fungal names would exceed these lengths. Cullen reported cultivar names up to 45 letters.

2.5 Plant Status (additional item requested by Synge)

Synge introduced the IUCN paper for a proposed PECS system (Plant Existence Categorisation Scheme, Paper 5). Many TDWG members would have databases in which the status of a plant in an area was being recorded. The present PECS proposal was a draft for possible use as a standard so that such data could be exchanged between databases. The essence of PECS is that the status of a plant in an area has several distinct components: occurrence, endemism, origin, cultivation and degree of threat.

Bisby thought that many projects such as ILDIS would be interested in adopting PECS if a good scheme could be agreed. Before adopting the present proposal, however, it was important to resolve quite large variations in taxonomists, agriculturalists and conservationists usage of words such as "introduced" (e.g. to the wild, to cultivation or to the area?), cultivated (e.g. frequently cultivated or domesticated?). ILDIS would like to propose changes: 1) That "extinct" be removed from the "degree of threat", and included in "occurrence". It seems unhelpful to

record a plant that is extinct as "definitely present but extinct"; 2) The conditions in the "cultivation" field should be improved both to allow a definite "wild" recording, and to improve the general acceptability of subdivisions.

Agreed: to allow time for detailed discussion at the next TDWG meeting when members had had time to consider the draft PECS system, and to raise problems with Synge.

Session 3: Nomenclatural indexing - 17 Nov., p.m.

3.1 Index Kewensis

Clayton reported work on rectifying the backlog in IK publications and on plans to make IK into a database. There is a queue of material awaiting publication - Supplement 17 (1976-80), Supplement 18 (1980-85), and the Annual Supplement for 1986. The 5 Year Supplement would continue. Progress has been delayed by shortage of staff. Plans for a database depended on the machine-readable files for the present Supplements, and on utilising the back-numbers. The back-numbers had been optically-scanned, but difficulties with type-face and inherent error-rate in scanning had left an enormous error-correcting task of about 7 man-years work. (See also Paper 2).

In response to queries as to whether the database planned could, for instance, be searched by particular fields or by authorities, Clayton was uncertain. He explained that as he understood it, the database would be held in a textual system without structuring into fields. Duncan offered assistance from Berkeley in correcting errors on the back-number tapes.

Bisby asked whether there had been design work and pilot usage studies for on-line querying. Apparently there had not been any.

There was discussion about the publishers. Presumably if the 5 year Supplements continue as high quality, durable products, the Annual Supplements could be produced more cheaply and rapidly. Asked about a date for the Annual Supplement 1986, Clayton thought publication would not be available in time for the Berlin Congress (July, 1987) because of the queue. Some surprise was expressed. This might lead to the failure of the McNeill & Brummitt proposal (for handling registration of names) which depended on Kew demonstrating that Annual Supplements would be published rapidly.

There were further enquiries - would there be a system of downloading lists say from CD-ROM discs?, had there been preliminary market testing with data-base spinners such as CABI, DATASTAR or BIOSIS? had their been experiments with the interface and the retrieval facilities? - to all of which the answer seemed to be no.

Agreed: 1) that there was great interest in the progress of IK and concern that it should be developed as rapidly as possible.

Agreed: 2) that there was a willingness to assist in undertaking some of the tasks involved, and even to assist in fund-raising if necessary.

Agreed: 3) that, on behalf of the international spread of institutions and projects represented, TDWG urge K to give the very highest priority to the prompt publication of the Annual Supplement for 1986 and following years.

3.2 Gray Index (Harvard University)

Shaw explained that the original Gray Cards series was started in 1891 at USDA, originally covering algae and fungi as well as vascular plants, all from the New World. Each name (including infraspecific names) was given a card to be placed in alphabetic position. Listed against each name were homotypic synonyms. In recent years the whole exercise at the Gray Herbarium grew to about 3,000 cards per year, and data entry occupied a large fraction of her time, with no assistance. In 1985 a switch was made to the new Gray Index on microfiche. Despite this being just another form of hardcopy, the Index is more compact, and the 120 or so subscribers receive a freshly sorted cumulative Index each year, the cumulative Index starting from 1985. The system seems to have a large overlap with IK and as this, like IK, had suffered through shortage of funds, Shaw thought any suggestions for cooperation would be welcomed.

There was discussion of how to include the back-log (c280,000 cards), and Duncan mentioned similar difficulties at Berkeley with an optical scan of the Index Nominum Algorum. Would it not be sensible for some general design, prototyping and testing to be done on an indexing system for use by IK, Gray Index, Fungi, Algae etc?

Members expressed surprise that there had never been collaboration between the Gray Index and IK and there was some discussion of possible opportunities.

3.3 TROPICOS (Missouri Botanical Garden)

Magill explained that the purpose of the TROPICOS system at MO is to serve a dual role as an interface between a taxon-oriented system (such as those discussed in the next session) and name-oriented systems such as IK. Only the Index Muscorum part of TROPICOS is purely name-oriented in purpose. However, TROPICOS presently contains approx 178,000 names and associated data for vascular plants. A paper describing TROPICOS (Paper 6, two parts) was circulated and members saw the system in action at a subsequent demonstration.

3.4 Need for a Nomenclatural Indexing Workshop

Agreed: that Berkeley (I.Nom.Algorum) K (IK), Harvard (Gray Index), MO (Index Muscorum), USDA (Mycology), Field Museum & G (Index Hepaticae) be invited to form a consultative group on nomenclatural indexing to report back to the next TDWG meeting on

i) general properties of indexing systems
and ii) the opportunities for collaboration between IK and Gray Index.

(Duncan invited to convene)

3.5 Registration of Plant Names

Greuter circulated a paper "Proposals on registration of plant names, a new concept for the nomenclature of the future" (Paper 7 from Taxon 35: 816-819), and introduced the proposals by the Committee for the Registration of Plant Names. He was urging the coming Congress at Berlin to accept the principle of registration, so that the 6 years before the next Congress would be available for funding, designing and testing a database system. If that next Congress adopted the system, an international coordinating body, the "big bang" of starting the system, and subsequent mandatory registration could all begin. He envisaged a database with registration being a continuous process and access to the database being available continuously, or through hardcopy produced when needed.

About 11,000 plant names are generated each year and Greuter planned to register the name, the protologue, full reference to the basionym and to check that the basionym is validly published.

Session 4 - Taxon-oriented systems, 18 Nov. a.m.

Bisby reminded members that this session would deal with systems in which the objects of attention were taxa. Whilst such systems have obvious links with name oriented systems, they also have some distinctive features.

i) that taxonomic judgements are implicit in the acceptance of a given name and synonymy for a given delimitation of a taxon

ii) that it is in these systems that general biologists are most interested because they want taxon information.

iii) that many classes of non-taxonomic data may be included and consequently production of the database may involve taxonomists in partnerships with other disciplines. This may take the form of taxonomists providing a nomenclator or taxonomic module for particular systems.

4.1 Rates of Change

Because taxon-oriented systems must endure a constant flux of changed taxa and of changed accepted names it is of considerable interest to assess the actual rates at which these occur. Gibbs Russell had sent a written report (Paper 8) containing figures for the number of name alterations in Southern African Plants (1% per yr over 50 yrs), in Southern African Grasses (1.9% per yr. 1955-1984), and within PRECIS (1.8% in 1984, 6.6% in monocots & cryptogams in 1985). Shaw had noted that in one year for the Gray Index 589 new names were changes caused by taxonomic opinion, that is about 0.45% of all names per yr. Heywood believed the number of changes amongst Pteridophytes, a notoriously changeable group, between edition 1 and edition 2 of Flora Europaea, was c.80% - that is approx. 3% per yr.

4.2 Accepted names and synonymy

The system devised by Clayton for categorising the status of names had been appended to the TDWG 1 report. There was discussion of alternative names - available synonyms includes very many names not really thought of as sensible alternative names, whereas alternative accepted names is the genuinely usable subset of available names.

Allkin circulated a paper "A Minimal Functional Nomenclator for Species Diversity Databases" (Paper 9). It describes a nomenclatural module containing the minimal nomenclatural detail needed for a taxon-oriented system, and may be suitable for adoption as a standard for use by TDWG members, or for recommendation to others. It has been incorporated in the ALICE Biological Checklist & Species Diversity System (described in Paper 10), which is being used by ILDIS (International Legume Database & Information Service) and other projects. Members were able to see ALICE working at a subsequent demonstration.

The Minimal Functional Nomenclator allows each taxon just one accepted name (either an accepted name or a provisionally accepted name) and linked to the accepted name can be any number of synonyms, misapplied names and doubtful synonyms. The Nomenclator ensures that, with the exception of misapplied names, names may be used only once, and that homonyms are handled intelligently.

Agreed: to invite ILDIS, Smithsonian, K, IUCN to form a small group to advise on the "checklist module" suitable as a standard in taxon-oriented systems, and to report back to the next TDWG meeting (Bisby asked to convene).

4.3 Standardization

Heywood described the Council of Europe's initiative in trying to establish an acceptable system of standard lists of names for the plant and animal species found in Europe. There had

been a series of meetings of the Council of Europe's "Colloquy on Computer Applications in the Field of Nature Conservation " in 1984, 1985, 1986. At these meetings it became clear that a significant impediment to data exchange between nature conservation databases (and in many other areas) was caused by taxonomic instability and large variations in the checklists in use. The Colloquy had formed a working Group to examine the problem (1985), and had subsequently (1986) accepted the Group's recommendation that standard lists should be produced or adopted for all groups of organisms.

The intention is that the Standard Lists (see IUCN's proposal - Paper 11) should be frozen as the standard for data exchange possibly for 5 year periods. The lists would be available for voluntary use by different projects, and "freezing" of the lists would in no way interfere with normal taxonomic change. The list would itself need to contain cross-indexing of synonyms, and would clearly at certain times be out-of-date with respect to the correct name of a taxon. Many nature conservation databases would continue to use their own local version or choice of names, but would cross-index conservation data to the Standard List prior to exchanging it with other databases.

"Botanic gardens will bless your name forever!" was amongst comments in support. Hawksworth commented on the existence of an FAO/WHO standard list for plant quarantine fungi, and McNeill on the ISTA list for weeds. Morin expressed concern that taxonomic treatments might be affected despite the intention that they should not.

Greuter made the point that adopting a Standard List meant adopting the classification, (e.g. the delimitation of taxa) as well as the names: it would be a large task. McNeill thought the initiative would be valuable and that the lists should be widely publicised in a journal such as Taxon.

There was general agreement to support the Council of Europe's Standard Lists initiative and to ask Bisby and Heywood to report back to the next TDWG meeting.

4.5 BIOSIS Taxonomic Reference File

Dadd reported that BIOSIS' TRF (Taxonomic Reference File) project was very much concerned with the idea of delivering accurate taxonomic checklists and hopefully the nearest thing to standard lists, over the counter to a wide range of biologists. The bacterial TRF is now undergoing online tests in USA from Philadelphia. He thought BIOSIS would be willing to assist in a standard lists exercise.

4.5 Exchange formats

Synge described the Botanic Gardens International Exchange Format for botanic garden records. It had proved reasonably easy

to identify a minimal set of common data elements to be used when botanic gardens transfer records of their holdings to other organisations such as those involved in conservation. The format consisted of a simple set of fixed length fields to be placed in an ASCII consecutive file. Because the records are for labelled specimens, authorities and synonyms are not needed. Walters is writing a standard software package to handle the records and to receive and send data in the exchange format.

Allkin circulated a brief description of the ILDIS Data Exchange Format (Paper 12). The format had been designed initially for use in transferring checklist data (the minimal functional nomenclator), geographical distribution and common knowledge data between other databases and ILDIS, but it was hoped to generalise the format so that it might be of use to other members of TDWG.

The format is designed to be independent of computing environment and software packages, and sufficiently flexible that precise data types and punctuation characters can be defined in each data set. In general the data would be spelled out in full in taxon order, with keywords under each taxon marking particular fields. The only data field to be included in codified form is the bibliographic citation in cases where a numbered bibliography precedes the taxon data.

There followed some discussion on the contrasts between the two exchange formats, and the contrasting circumstances in which they were to be used. The Botanic Gardens Format is for use with a fixed data set and by botanic gardens some of which lack computing personnel. The ILDIS Exchange Format reflects the need to accommodate more complex and varied data and the fact that it will be used by projects with some computing expertise.

Agreed: to ask members to give Synge and Allkin their comments on the exchange formats, and to give further debate to this topic at the next TDWG meeting.

4.6 Designs for a global plant information system

Bisby outlined a proposal that TDWG should organise a major international symposium devoted to ideas on global plant information systems. The topics would be relevant to a range of scenarios from the minimalist approach, that many of today's systems might make arrangements to collaborate, to a maximalist approach, that some kind of unifying network or global system might be envisaged. The symposium would provide a forum for papers describing the technical aspects involved : the emphasis would be on examining the wide range of options:

1) definition of tasks and need
2) logical designs - for nomenclatural indexing
   - for taxon-oriented nomenclators
   - for wider botanical information
   - for global systems
3) taxonomic decision-making
4) data exchange and exchange formats
5) communications
6) project management designs.

Agreed: to ask Bisby, Heywood, Duncan, Morin, Synge & Kiger to form a planning group to report to the next TDWG meeting with firm plans for the symposium (Bisby invited to convene). There was approval for the idea of holding it in July 1988, possibly in California or in Europe.

4.7 Survey of taxonomic databases worldwide

Synge reported that Gregg at the US Parks Service had done only informal work and that the field is wide open - we still need an organisation to undertake this. Kiger thought that, as the Hunt had already run the international register of plant systematists, this was a task that the Hunt might be interested in. He would need assistance, however, from many of those present.

BIOSIS had previously expressed some interest. Dadd thought BIOSIS would be most interested in a zoological equivalent.

Agreed: to ask Kiger, Dadd, Mackinder, Bisby and D. Farr to form a consultative group to report back to the next TDWG meeting (Kiger invited to convene).

Session 5 - Continuing activities - 18 Nov. p.m.

5.1 Status and affiliations of the Group

Members agreed that it should remain an ad hoc international working group carried forward by its own momentum without formal affiliation. However it should continue to make itself known to organisations such as IUBS, IAPT, CODATA and Council of Europe on an informal basis, and to aim for some public awareness, perhaps through notices in Taxon. McNeill circulated an "Organizational Chart of Botanical Nomenclature" (Paper 13) which illustrates the complex relationships between IAPT, IUBS, the International Botanical Congress, and the Bureau of Nomenclature.

It was agreed to stay botanical, but to seek extended international coverage.

5.2 Election of Convenor and Rapporteur

Heywood was asked to continue as Convenor, and Bisby as Rapporteur for another year.

It was also agreed that Kiger should operate a US office for the distribution of materials and possibly the start of a newsletter. Dadd kindly agreed to provide through BIOSIS a TELECOM GOLD/DIALCOM closed user group for electronic mail and bulletin board communication. It was also agreed to relay notices onto the Berkeley Bulletin Board system run by Duncan.

It was agreed to continue limiting the size of the group so that it could continue with informal meetings round a large table. This meant that the group would continue with the present position of major international institutes and international database projects being members, and of other institutions or projects sending observers as appropriate.

5.3 Next meeting

The meeting accepted gratefully an invitation for the next meeting to be held in October 1987 at the Royal Botanic Gardens Edinburgh with co-sponsorship by IUCN (CMC), CABI and BIOSIS.

It was noted that there was still an outstanding invitation from the Missouri Botanical Garden, and that there were hopes that this might be the venue for autumn 1988.

5.4 Adjournment

The chairman expressed the views of the whole meeting in thanking Kiger and his colleagues for the warmth and generosity of their hospitality during the last few days. It had been efficient and useful as a meeting and above all an enjoyable occasion too. (Kiger and his colleagues were applauded). Kiger responded by thanking Bisby and Heywood for the work they had done in preparing the meeting.

F.A. Bisby (Rapporteur)
assisted by D.A. Sutton

SOUTHAMPTON, UK.

Appendix 1

Abbreviations and Acronyms used in this report

Organisations (with location of headquarters or secretariat)

BIOSIS	Biological Sciences Information Service (Philadelphia, U.S.A.)
CABI	CAB International (Farnham Royal, UK)
CODATA	Committee for Scientific Data (Paris, France)
ESF	European Science Foundation (Strasbourg, France)
FAO	Food and Agriculture Organisation of the UN (Rome, Italy)
G	Herbarium of the Conservatoire et Jardin botaniques (Geneva, Switzerland)
IAPT	International Association for Plant Taxonomy (Utrecht, Netherlands)
ILDIS	International Legume Database & Information Service (Southampton, UK)
ISO	International Standards Organisation
ISTA	International Seed Testing Association
IUBS	International Union of Biological Sciences (Paris, France)
IUCN	Int. Union for the Conservation of Nature, Threatened Plants Centre (Kew, UK)
K	Herbarium of the Royal Botanic Gardens (Kew, UK)
MABII	Man and the Biosphere Project II (UNESCO), (Washington, U.S.A.)
MO	Herbarium of the Missouri Botanical Garden (St. Louis, U.S.A.)
NY	Herbarium of the New York Botanical Garden (Bronx, U.S.A.)
PRECIS	Herbarium of the Botanical Institute Pretoria, Computer Infor. Syst.
TDWG	Taxonomic Databases Working Group for Plant Sciences (Southampton, UK)
UN	United Nations
UNESCO	UN Educational, Scientific and Cultural Organisation (Paris, France)
USDA	United States Department of Agriculture (Beltsville, U.S.A.)
WHO	World Health Organisation (Geneva, Switzerland)

Technical

ASCII	American Standard Code for Information Interchange (Binary code for symbols)
CD-ROM	Compact Data - Read Only Memory (Discs)

Appendix 1 (continued)

Documents/Publications/Systems (with responsible institution)

BPH	Botanico-Periodicum-Huntianum (Hunt Inst., Pittsburgh)
BPH-2	Supplement to BPH
IK	Index Kewensis (Royal Botanic Gardens, Kew)
ING	Index Nominum Genericorum (Smithsonian, Washington)
PECS	Plant Existence Categorisation Scheme (IUCN, Kew)
TDWG1	Minutes of the first meeting of TDWG at Geneva, 1985
TL-2	Taxonomic Literature (Second Edition) (IAPT, Utrecht)
TRF	Taxonomic Reference File (BIOSIS, Philadelphia)

Appendix 2

Papers circulated to participants at the Second Meeting in Pittsburgh

Extra copies of these papers may be obtained from:

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bitnet TJ50 at TB.CC.CMU.EDU

1 Draft Geographical Classification, Mackinder, IUCN
2 Computers & Databases at Kew, Clayton, K
3 Summary of botanical databases at the British Museum (Natural History), Sutton, BMNH
4 The Length of Plant Names, Synge, IUCN
5 Plant Existence Categorisation Scheme (PECS), IUCN
6 TROPICOS: a Botanical Data Bank at the Missouri Botanical Garden (2 parts), Magill, MO
7 Proposals on registration of plant names, a new concept for the nomenclature of the future, Greuter, Committee for the Registration of Plant Names (Taxon 35 : 816-819)
8 Rates of change in the taxon-based component of PRECIS, Gibbs Russell, Pretoria
9 A Minimal Functional Nomenclator for Species Diversity Databases, Allkin, ILDIS
10 ALICE: Biological Checklist & Species Diversity Database System, Winfield, Allkin & Bisby, Edinburgh & Southampton
11 The IUCN Draft Proposal (to the Council of Europe, on Standard Lists), Heywood, Synge & Leon, IUCN
12 ILDIS Exchange Data Format, Allkin & White, ILDIS
13 Organizational Chart of Botanical Nomenclature, McNeill & Greuter, IUBS
14 Taxonomic Databases Working Group: minutes of the first meeting (Geneva, 1985) Bisby, Southampton (TDWG1)