PRODUCTION OF A BOOK CATALOGUE AT THE PLANT RESEARCH LIBRARY:
APPLICATION OF THE UNIVERSITY OF TORONTO LIBRARY AUTOMATION
SYSTEM   (APPLICATION DU SYSTÈME D'AUTOMATION POUR BIBLIOTHÈQUES
DE L'UNIVERSITÉ DE TORONTO: PRODUCTION D'UN CATALOGUE EN
VOLUME A LA BIBLIOTHÈQUE DE RECHERCHES SUR LES VÉGÉTAUX)

Marta M. Khan
Canada Department of Agriculture Library Division
Ottawa, Ontario, K1A 0C6

ABSTRACT

The Plant Research Library, Agriculture Canada, is
currently applying the University of Toronto Library
Automation System (UTLAS) to the conversion of its
card catalogue into machine-readable form and to the
production of a printed book catalogue. Additionally,
it is intended to upgrade catalogue records in line
with current national bibliographic standards and to
share cataloguing information in a machine-readable
union file. This paper reports the development and
current status of this project. It is expected that
experience gained in this project will be applicable
to the development of automated cataloguing support
in the Departmental Library System.
(La Bibliothèque de recherches sur les végétaux,
Ministère de l'agriculture du Canada, applique pré-
sentment le Système d'automation pour bibliothèques
de l'Université de Toronto pour convertir son catalogue
sur fiches en memoire d'ordinateur et produire un
catalogue en volume. En plus, nous avons l'intention
d'améliorer les fiches au niveau de standard des
bibliographies nationales et partager ces informations
dans un catalogue collectif. Le présent rapport a
pour but de vous informer sur le développement de ce
project. Il est en espérer que l'expérience acquise
par ce project d'automation sera applicable au Système
de bibliothèques de notre Ministère.)

INTRODUCTION

The initial conception for an automated book catalogue in printed form arose as a result of interest on the part of research scientists within the Plant Research Institute. These scientists, engaged in taxonomic research in botany, find the literature of this field an essential tool, much like laboratory equipment in other fields of research. A desk copy of the resources of the library would be an invaluable aid, saving much research time in consulting the card catalogue and the shelves for needed material. Furthermore, copies of a book catalogue could be deposited in the two other branch collections operated by the Plant Research Library, in the Headquarters Library, and in the twenty four other Field Libraries within the Dept. of Agriculture Library system. The resources of the Plant Research Library are highly specialized in the field of taxonomic botany and are the most complete in Canada in this field, often containing original editions of works dating as far back as the seventeenth and eighteenth centuries, the origin of modern systematic botany and mycology. It was therefore felt that a printed catalogue distributed to researchers and botanists within our Department as well as other interested institutions would prove a very valuable tool to the agricultural research community.

Furthermore, the Plant Research Library Committee, members of which have made extensive use of computer techniques in their work in numerical taxonomy, were able to perceive the long-range benefits of an automated library cataloguing support system. These benefits are apparent in reducing manual routines such as typing and filing catalogue cards, typing acquisitions lists, revising catalogue cards, and manually compiling subject bibliographies. Once the Library Committee voted to support the book catalogue project as a priority for the Library, approval and support were sought from the Departmental Library. At the Headquarters Library, the proposal to produce an automated book catalogue was regarded as an opportunity to initiate a pilot project in the field of automated cataloguing support, which if successfully implemented on a small scale on a cost effective basis, could possibly be applied at some of the other Field Libraries and eventually at the Headquarters Library itself. Moreover, this project was considered to complement other computer applications in progress at the Headquarters Library. Examples of such applications include: (1) Compilation of the Union List of Serials in Canada Dept. of Agriculture Libraries, completed in January 1974, and its first Supplement, which will include the Serial holdings of all the Field Libraries and is scheduled for completion this summer. (2) The recently started Subject Authority List project, the objective of which is to edit and update the subject headings in use by the Headquarters Library and convert this file into machine-readable form.

PRINCIPLES

The proposal for the pilot project was based on the following general guiding principles:

(1) To develop a machine-readable file of catalogue records (retrospective and current), and produce a printed book-form catalogue of Plant Research Library holdings.

(2) To build sufficient flexibility into the contents and structure of the machine file to allow for its future integration into a union file that could ultimately encompass all the libraries in the Agriculture Canada System, in order to support the concept of shared cataloguing.

(3) To build sufficient flexibility into the machine file to allow for its uses in the support of technical processing and in resource sharing by interlibrary loans.

(4) To adhere strictly to national bibliographic standards in order to develop compatible records, in accordance with developing national and international bibliographic information networks.

CHOICE OF SYSTEM

In the search for a system that would meet our requirements, the following factors had to be considered:

(1) Funds and personnel for systems design and development of programs were non-existent within our Department for a project of this complexity. Therefore the system we were seeking was expected to have the necessary software and hardware successfully operational.

(2) The systems support should preferably reside in the local area, for ease of communications among personnel and for the solving of hardware or software problems.

A number of systems in the Ottawa area were surveyed in addition to the University of Toronto Library Automation System (UTLAS). Discussions were held with the Dept. of National Health and Welfare, the International Development Research Centre, and the National Library about the systems that were operational at these locations. It was originally intended to use an adapted version of the computer programs for data entry and editing being developed by the National Library. When it became clear, however, that their programs could not be made available at that time, we began negotiations with the UTLAS, where the Ontario Universities Libraries Cooperative System (OULCS) had been successfully implemented.

The rationale for the decision to become a user of the UTLAS cataloguing support system was based on the following factors:

(1) The system was seen to have the capability to handle our requirements for data entry, editing, manipulation and display within existing facilities, requiring a minimum of custom programming.

(2) The system had the capability to produce a variety of printed outputs such as catalogue cards, book-form catalogues and special listings in a variety of formats.

(3) Options exist for the support of technical processing, such as production of printed spine labels and circulation cards, should a future decision be taken to implement such options.

(4) The OULCS standards for the coding of bibliographic data for machine input are based on the Canadian MARC format for monographs, and are therefore compatible with national and international standards for the exchange of bibliographic data in machine-readable form.

(5) The option of a MARC catalogue record service exists for obtaining derived cataloguing from LC, BNB and Canadian MARC tapes, should a decision be taken to implement such a service at a later date.

STRUCTURE OF FILES

As an individual user of the UTLAS system, we have access to our own records (local files), which consist of:

Active file - sufficient storage space has been allocated for approximately 1000 records of 200 characters each (i.e. 200,000 bytes), in the active work file. Additional active storage is available if required. These records are available for immediate display.

Passive file - almost unlimited passive storage is available for data not currently in use. These records are displayed the following day after being requested.

Access keys - the system provides for access to the active and passive files by means of: LC card number, ISBN number, User record sequence number, and the exact title. These are the means by which catalogue records are retrieved from the files.

On-line Data Display

Catalogue records in active storage are displayed by means of a VU COM terminal which has upper and lower case. Diacritics are indicated by means of special codes for printing in hard copy, but are not displayed as such on the terminal screen. A printer can be attached for obtaining on-line hard copy of records in active storage. The terminal is connected to the University of Toronto Library Automation Center by means of Bell Canada's Data Route.

Batch Mode

Catalogue records are retrieved in batch mode in the form of semi-weekly printed edit lists. An acquisitions bulletin containing current cataloguing is printed in call-number sequence every three months. The final hard-copy products, printed in batch mode,

are expected to take the form of separate author, title and subject
catalogues, and a call number sequence (shelf listing). Details
of format in the final products are presently under discussion.
Particular attention is being given to alternatives for page and
column layouts and size of print, in order to achieve maximum
conservation of space but preserve clarity and legibility.

PROGRESS REPORT

In January 1975, almost two years after the proposal for
the automated book catalogue was first presented to the Head-
quarters Library, the terminal was installed and our application
became operational. During that interval, we passed the stages
of convincing our Data Processing Division personnel of the merits
of this pilot project, preparing the proposal for Departmental
approval, identifying the most suitable system, waiting for Treasury
Board approval and for the agreement with UTLAS to be drawn up by
the Dept. of Supply and Services, and finally, for the terminal to
be requisitioned and the Data Route connection installed. We also
had the opportunity to plan workflow, compile procedural manuals,
design worksheets, study the OULCS standards for coding biblio-
graphic data for machine input, and begin the actual coding of
catalogue records.

A full-time librarian was hired in Jan. 1974 for the coding
of bibliographic data and for the supervision of input and editing
procedures. Our training in OULCS editing techniques of assigning
appropriate numeric tags to bibliographic fields (e.g. main entry,
title, imprint) and alphabetic codes to the subfields (e.g. place
of publication, publisher, date) was self-administered, by means
of practical application of the OULCS coding manual. The manual
was found to be very complete in detailed instructions and examples,
and posed few problems in its interpretation. Any difficulties
we have had in the use of tags and codes from the point of view of
the computer system have been very promptly resolved by the UTLAS
staff.

Organization of Workflow

Beginning December 1974, all new cataloguing (which can
originate either locally at the Plant Research Library, or at the
Centralized Cataloguing Unit at the Headquarters Library) was
designated as first priority for coding and inputting, in order to
produce regular accessions bulletins. Retrospective catalogue
records are coded in call number sequence from the shelf-list. The
shelf-list cards cannot be used as a basis for coding, however,
because the tracings appear only on the main entry card in the case
of the older catalogue records. The main entry must be located in
the author-title catalogue photocopied, and the copy attached to the
coding worksheet (see Fig. 1 for example of coding worksheet). The

shelf-list cards are suitably marked as having been pulled for
coding, and all cards are refiled. Approximately twenty shelf-
list cards can be processed in this way in one hour. The
catalogue records are then examined by the coding librarian,
who assesses the completeness of the catalogue information in
terms of whether AACR rules are followed and whether minimum OULCS
standards are met. If amendments or additions are necessary, the
level of cataloguing is upgraded at that point, or if the record
requires complete recataloguing, the record is set aside for
later attention.

Once the coding worksheet is completed, it passes to the
terminal operator for input. All input is done from coding work-
sheets prepared by librarians (see Fig. 2 for flowchart of the
bibliographic coding and input operation). Semi-weekly edit lists
are received from UTLAS (see Fig. 3 for example of edit list)
and proofread by the coding librarian, who indicates corrections
for the terminal operator. When the records have been edited and
are in their final form, they are "stored" in passive storage for
the printing of the hard-copy products. At present one full-time
and one half-time librarian are employed in coding and editing
procedures. The services of a half-time terminal operator are
provided by the Headquarters Library. The on-line system is
available to us for four hours every morning. An experienced
terminal operator can input approximately 10 records in one morn-
ing, in addition to making corrections on work in progress and
entering corrections from edit lists. An experienced coder
librarian can code approximately three catalogue records in one
hour if the records do not require extensive additions or revis-
ions in cataloguing content. A policy file is maintained of
decisions taken on the application of bibliographic codes.
Statistics are tabulated on the numbers of records coded, input,
edit lists received, and records corrected.

Problems in Conversion

When the coding of our catalogue records for machine input
was actually begun, it became apparent that a high proportion (so
far approximately 50%) of retrospective catalogue records were
either below OULCS bibliographic standards, or did not comply with
AACR rules. Basic fields such as imprint, collation, obvious
series entries, subject tracings and added entries, were often
missing, especially in the case of catalogue records which were more
than seventeen years old. A decision had to be taken on upgrading
substandard records (which of course implies recataloguing to
various degrees). Although the temptation to recatalogue is great,
it was realized that if an attempt were made to correct every sub-
level record, the project would be completed long after our estim-
ated target date.

For pragmatic reasons, therefore, it was decided that if the existing catalogue information was sufficient to identify the item, and the minimum fields mandatory to the OULCS system were present, it would be coded and input. The system does make provision for identifying incomplete cataloguing, and the records are thus coded for later retrieval and updating. Records that require complete revision are set aside for recataloguing on a time-available basis. So far, 10% of sub-level records have either been completely recatalogued or set aside.

Another major problem was lack of standardization in use of personal author and corporate author headings. In past years, before cooperative and centralized cataloguing were introduced in the Departmental Library System, cataloguing was done entirely by the Field Libraries. Because of lack of basic cataloguing tools such as LC and NUC catalogues in the Field Libraries, it was often impossible to verify and standardize author headings locally. Many inconsistencies have crept into our catalogue. For example, often the same author is represented in our catalogue by several different forms of his name: with forenames fully spelled out, with a combination of initials and forename, and with initials only. Such headings can be interfiled in one sequence if it has been verified that the different forms of name indeed represent a single author or in separate sequences, if no verification occurred. It was decided that since such inconsistencies would become readily apparent in a printed book catalogue, an attempt would be made to standardize personal and corporate headings and series entries wherever possible following LC usage as the authority. It was further decided to change corporate headings in alignment with new AACR rules, and create all necessary links among corporate headings which have changed names.

Personal and corporate heading files were therefore established in order to maintain consistency in the use of headings. These files grew so rapidly that alternatives to manual updating and filing were sought. Alphetext applications already in use in our Headquarters Library for the production of author and title indexes were available. A standard Alphetext sort program was easily adapted to our requirements for mechanized printing and updating of author and corporate heading lists. These lists are printed weekly, cumulating additions and changes from the previous week (see Fig. 4 and 5). The advantages of authority lists as opposed to files are ease of scanning and availability of multiple copies to coding librarians.

Another problem, although probably unique due to the nature of our subject specialization, is that posed by our collection of Herbaria in microfiche format. These are collections of dried plant specimens in microfiche form, of which we have a substantial number. They are non-book media without author, title,

imprint etc., and so do not conform to OULCS standards for biblio-
graphic coding for monographs. Yet they are essential elements
in our book-form catalogue. We decided to code the name of the
collector in the author field, the name of the Herbarium in the
title field, followed by the description of the Herbarium. The
other fields are left blank. These records have been coded with
a false "date entered" so that they can be easily removed from
the file should we join a shared cataloguing support system at a
later date.

CONCLUSIONS

The book catalogue automation project underway at the Plant
Research Library has so far partially met the objectives intended for it.
Specifically, these are:
(1) The small-scale implementation of an automated system
for cataloguing support.
(2) The practical application of national bibliographic
standards for the coding of data for machine input, in order to
upgrade retrospective catalogue records.
(3) An attempt at solutions to problems posed by the re-
trospective conversion of bibliographic records, in anticipation
of future applications of automated cataloguing support on a
larger scale.

It should be emphasized that the objectives of our local
application of the UTLAS system do not presently call for the
utilization of the system to its full capability. In the planning
of our local application, however, we have attempted to allow for
future expansion of the system to our other Field Libraries and to
the Headquarters Library. Furthermore, we have attempted to allow
for the future uses of automated cataloguing support of various
functions in addition to the one with which we are specifically
concerned here, such as catalogue card production, technical pro-
cessing and interlibrary lending.

From the discussions presented in this paper, it is
evident that the major immediate benefit of this application will
come from the distribution of multiple copies of a book catalogue
and specialized bibliographies which will provide access to a
unique bibliographic resource to remote users, and from the event-
ual decrease in manual catalogue maintenance.

ON FILE			
5. COUNTRY of PUB'N	6. ILLUS.	8. FORM of REPROD.	9. FORM of CONT.
10. GOV. PUB.	11. CONFERENCE PUB.	12. FEST. IND.	13. INDEX IND.
14. M.E. IN BODY	15. LIT. TEXT	16. BIOG.	17. LANG.
18. MOD. REC.	19. CAT. SOURCE		

TAG	INDICATOR		
	1	2	
LC/010			
SBN/020	⌀	⌀	
CAS/040	⌀	⌀	$200Aq $bENG
GEO/043	⌀	⌀	
LCP/090	1	1	
MEP/100			
MEC/110			
TIL/245			
EDN/250	⌀	⌀	
IMP/260		⌀	
COL/300	⌀	⌀	
NOG/500	⌀	⌀	
NOB/504	⌀	⌀	
SUT/650	⌀	4	
AEP/700			

Fig. 1. Coding Worksheet
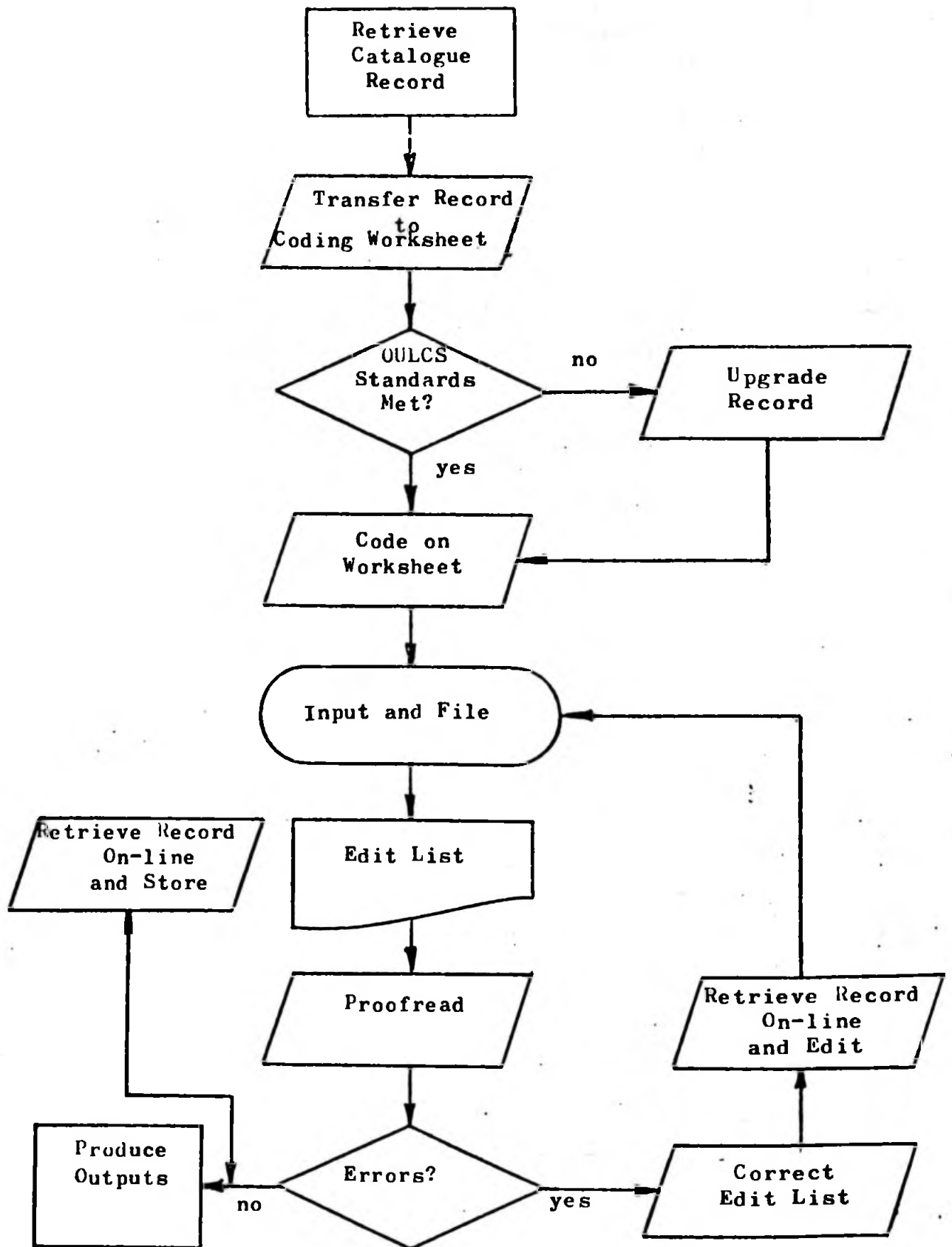
Fig. 2. Bibliographic Coding and Input Operation Flowchart

DEPT. OF AGRI. EDIT LIST

```
RSN   32000001              DCH    75JAN30
TCH   1043                  OPN    DAGA
RTN   ODAG
UPD   0001
WHO   DAG
DTE       750130
DTC       s
DT1   1973
PLC    inu
ILS       a
LNG       eng
CSC       c
LCP   10          $a584.9  W726  1973
MEP   10          $aWilliams, Robert Dale
TIL   10          $aBiosystematics  of  the  Setaria
      viridis  complex  (Gramineae)
IMP   0           $a[Lafayette, Ind]  $bPurdue
      Univ.,  1973.
COL               $axi,  87  l  $billus.
NOG               $aMicrofilm-xerography:    Ann
      Arbor,  Mich.,  Univ.  Microfilms,  1974.
NOD               $aThesis - Purdue  University.
NOB               $aBibliography:   86   l.
SUT   4           $aGreen  bristlegrass  $i01
SUT   4           $aSetaria  viridis  $i02
SUT   4           $aGramineae  $i03


RSN   32000003              DCH    75JAN30
TCH   1605                  OPN    DAGA
RTN   EDAG
UPD   0003
WHO   DAG
DTE       750130
DTC       s
DT1   1973
PLC    inu
ILS       a
LNG       eng
CSC       c
LCP   11          $a584.9  W726  1973$b0AgB
MEP   10          $aWilliams, Robert Dale
TIL   10          $aBiosystematics  of  the  Setaria
      viridis  complex  (Gramineae)
IMP   0           $a[Lafayette, Ind.]$bPurdue
      Univ.,$c1973.
COL               $axi,  87  l.,  $billus.
NOG               $aMicrofilm-xerography:    Ann
      Arbor,  Mich.,  Univ.  Microfilms,  1974.
NOD               $aThesis - Purdue  University.
NOB               $aBibliography  86  l.
SUT   4           $aGreen  bristlegrass  $i01
SUT   4           $aSetaria  viridis  $i02
SUT   4           $aGramineae  $i03
```

```
RSN   32000004              DCH    75JAN30
TCH   1436                  OPN    DAGA
RTN   ODAG
UPD   0001
WHO   DAG
DTE       750130
DTC       s
DT1   1969
PLC    ilu
ILS       a
LNG       eng
CSC       c
LCP   11          $a635.969  P317  1969$b0AgB
MEP   10          $aPatterson, James A.
TIL   10          $aContainer  growing.
IMP   0           $aChicago,$bAmerican
      nurseryman,$c1969.
COL               $a174  p.$billus.
NOG               $aReprinted  from  the  American
      nurseryman.
SUT   4           $aPot  culture


RSN   32000005              DCH    75JAN30
TCH   1559                  OPN    DAGA
RTN   EDAG
UPD   0002
WHO   DAG
DTE       750130
DTC       s
DT1   1973
PLC    gw
ILS       ad
LNG       ger
CSC       c
LCN   .           $a  73357881
SBN               $a3437301594
LCP   11          $a580.12  F928  1973$b0AgB
MEP   10          $aFrohne, Dietrich
TIL   10          $aSystematik  des  Pfanzenreichs:
      $bunter  bes. Berücks. chem. Merkmale  u.
      pflanzl:  Drogen$evon  D.  Frohne  u.  U.
      Jensen
IMP   0           $aStuttgart,$bG.  Fischer,$c1973.
COL               $ax,  305  p.  $billus.  and
      graphs.
NOB               $aIncludes  bibliographies.
SUT   4           $aBotany$xClassification$i01
SUT   4           $aChemical  analysis$i02
SUT   4           $aMedical  plants$i03
AEP   10          $aJensen, U
```

Fig. 3. Edit List

```
De Seynes, Jules      SEE      Seynes, Jules de
De Vilmorin, R          SEE      Vilmorin, Roger de
De Vries, Louis      SEE      Vries, Louis de
De Wit, C      T          SEE      Wit, C          T          de
Delessert, Benjamin
Den Hartog, Cornelis      SEE      Hartog, Cornelis den
Descole, Horacio Raul
Dillenius, Joannus Jacobus
Döbereiner, P          A
Douglas, Robert
Duke, James A
Duranu, Ernest
Ehrendorfer, F
Everard, Barbara
Fairbrothers, David E
```

Fig. 4. Personal Name Authority Listing

```
Moskovskoe Obshchestvo Ispytatelei Prirody
Museul de Ştiinţele Naturii al Judeţului Bacau
Museum Botanicum Berolinense      SEE      Botanical Museum Berlin-Dahle
Museum Botanicum Hauniense
Muséum national d'histoire naturelle.
National Arboretum
National Institutes of Health
National Library, Quebec      SEE      Québec.  Bibliothèque nationale.
National Museum of Natural Sciences
National Mycological Herbarium.
```

Fig. 5. Corporate Name Authority Listing