Loading and Using 2004 MeSH in MARC Format

(14.2 patch 5)

Tuesday, June 15, 3:45-4:45

I. Introduction

I am very pleased to be able to tell you about our project of loading 2004 MeSH in MUSE, the McGill OPAC. Pat Riva planned the project, loaded the records, made the error listings, and advised me on what to do next. She couldn't be here to make this presentation, but she prepared a detailed report, and I have added parts of it to the handout so you can see exactly what she did.

a) Original MeSH File

Our original MeSH authority file was created in 1993/94 by Blackwells North America when we sent our catalogue out for authority control processing. The file included main headings and heading/qualifier combination records that corresponded to headings present in our bibliographic file at that time. We added no local updates to the MeSH authority records; we only typed in a few new headings from scratch or changed existing records in an attempt to keep the file up-to-date. In 1998, Blackwells turned over authority control to OCLC, and they deleted our MeSH master file, so we had not been able to add records during subsequent authority control processing with OCLC Lacey. MGU11 had about 19,000 records before we loaded the 2004 MeSH.

b) Final MeSH File

Now our MeSH file has about 523,000 records. The project to load 2004 MeSH and fix the associated bibliographic records took a long time because we were basically catching up with 10 years of work. Pat Riva spent about 3 weeks planning the project, testing the 2003 file, loading the 2004 file, and creating error listings for me to check. Ron Johnston spent 2 weeks scripting the steps for Pat. It took me about 2 months to go through the error reports, and I had help from database maintenance staff, so we can say that the project took at least 3 months total of staff time. Note that it took 2 additional weeks for the file to index and perform automatic updates.

c) Benefits

There are many benefits to loading the MeSH file and fixing the bibliographic records. For instance, users can now find similar works

under the same MeSH terms. At McGill, we have a very important history of medicine collection, and if we don't update subject headings, the older books end up separated from newer ones on the same topic. Reference staff will find it easier to teach subject searching to users. It will be easier for me to catalogue and teach others in the department to verify or add MeSH headings to records. We are also hoping that it will be straightforward to update the MeSH file each year.

II. Planning

a) NLM MeSH File

The full NLM MeSH file contains 3 types of records:

2003	2004	
21,973	22,568	descriptor records (150, 151 and 155)
83	83	qualifier records (180 subdivision records)
487,659	500,495	descriptor/qualifier combinations (150 $a $x)
509,715	**523,146**	**Total records** (127 MB for 2004)

This was the first time we loaded subdivision authorities at McGill. It's a valuable trial since subdivision authorities are also part of the full LCSH file.

b) Descriptor/Qualifier Combinations

Most of the MeSH authority file consists of descriptor/qualifier combinations. If these records are not loaded in Aleph, the cataloguer must rely on the MeSH Browser to check if a particular combination is allowed. It is risky to rely on old cataloguing records because NLM has been changing their subdivision practices. I especially noticed during the year that NLM is reducing the amount of allowable qualifiers. Many headings do not allow any qualifiers at all, and several headings may no longer be subdivided by *$x history*. We decided to load all of the combination records because we already had many of them in MUSE, NLM issues the file as a single entity, and it is simpler to have all the records anyway in terms of ongoing use of the file. It is faster in a copy-driven environment to verify headings if the full string matches an authority. The p_auth_03 job is also designed to work in an authority system where every possible heading has an authority record.

c) Ongoing Updates

MeSH is updated annually in the fall. The full base and update files may be ftp'd from the NLM Web site for free, once an online agreement is

completed. The main condition of the license agreement is that the source of the MeSH file and the year used be acknowledged in the OPAC. We decided to put this information in our catalogue's help files under Browse as follows: "Subject Indexes in MUSE are created using a controlled vocabulary. McGill uses two major sets of subject headings: Library of Congress (LC) and the U.S. National Library of Medicine's 2004 MeSH for health sciences subjects."

Next year, we will load the annual update file in the same way we loaded the main file. This file includes delete transactions (comparing new year to previous year). It could be handled with p_manage 31 if it had a parameter like the one in p_manage_36 that indicates which index to match against. P_manage_31 is a pre-processor and loader for LC updates, dividing the file into new records and deletes according to the 010. P_manage_36 divides a file into new, one match, or several matches, based on a choice of standard numbers. For MeSH, we need to use the 035.

III. Loading the full 2004 MeSH file in Aleph

a) Aleph Table Updates

The MeSH 1999 Conversion Specifications document on the NLM site is still the latest version of the MARC21 coding used in these files. NLM has made substantial changes relating to MARC21 and their new system since we first acquired authority records in 1993/94, so this has an impact on conversion, display and indexing tables.

Tables updated:

MGU11\tab:
      tab11   (create WSD, MTR, SBD, new indexes for 18x and MeSH Trees)
      tab00.eng
      pc_tab_sear.eng
      tab_fix
      tab07   (create for MGU11 to enable See also references in public web)
      path_convert   (as tab07 used to be shared with MGU10)
MGU11\tab\import:
      mesh.fix   (load profile)
MGU11\pc_tab\catalog:
      pc_tab_find.eng
      pc_tab_scan.eng
      scancode.dat
MGU10\tab:
      check_doc_line

edit_doc_999.eng
    [edit_field.eng ***   (Not changed: -- prior to subdivision auths is okay)
    tab33.eng
    tab_match
    tab_doc_merge
MGU10\pc_tab\catalog:
    taginfo.eng ***   (To do: input the 073 codes into the help)
MGU01\tab:
    edit_doc_99_aut_mgu10/11/12.eng
    tab_aut   (to cascade non-topical headings to MGU10)
    tab11   "
    tab20   "
MGU01\pc_tab\catalog:
    scancode.dat
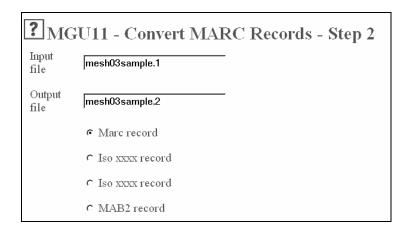

b) Sketch of the Initial Load Process

Ron Johnston scripted steps as a custom Web services job in MGU11, with *test* vs. *production* options. The production run with the 2004 file lasted 7hrs 15 minutes.

1. Ftp the file from U:\LTS\Common\Authority_MeSH to mgu11/scratch.
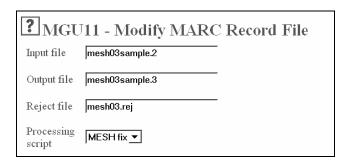   file name of 2003 sample is: marc03.sample.bin
    file name of full 2003 file is: marc03.full.bin
    file name of full 2004 file is: marc04.full.bin

2. Run p_file_01/p_file_02.

MGU11 - Convert MARC Records - Step 1

Input file   marc03.sample.bin

Output file   mesh03sample.1

MARC record format
- ○ MARC record in one block (fixed physical length - 2048)
- ○ MARC record in one block (fixed physical length - 512)
- ○ MARC records delimited by ## (fixed physical length - 80)
- ◉ MARC records delimited by '1D' separator
- ○ MARC records spread over various blocks (fixed physical length - 2048)
- ○ MARC records in SCW format (five digit physical record prefix)

MGU11 - Convert MARC Records - Step 2

Input file	mesh03sample.1
Output file	mesh03sample.2

- ⦿ Marc record
- ○ Iso xxxx record
- ○ Iso xxxx record
- ○ MAB2 record

3. Run p_file_08 with mesh.fix file.

MGU11 - Modify MARC Record File

Input file	mesh03sample.2
Output file	mesh03sample.3
Reject file	mesh03.rej
Processing script	MESH fix ▾

4. In the TEST run only: run fix&check (p_manage_25) to verify that the mesh.fix does not need any updates.

MGU11 - Fix & Check Catalog Records

Input file	mesh03sample.3
Output file for fixed & checked records	mesh03sample.fixed
Output file for rejected records	mesh03sample.rej
Fix routine	Fix routine 3 - MARC21 preserve spaces ▾

5. A TEST run ends with step 5.

Use p_manage_36 with a match profile to match by 035 (NLM).
This splits the file into records to overlay and records that are new.
Multiple matches are an error and need to stop a production load.

Note that since the match is by record number, duplicate authority records are loaded when NLM changes the record number for a heading. These duplicates are identified by the obsolete authority records report and also by p_auth_04 if headings are the same.

MGU11 - Check Input File Against Database

Input file	mesh03sample.3
Output file 1	mesh03sample.new
Output file 2	mesh03sample.match
Output file 3	mesh03sample.multi
Match section (defined in tab_match)	NLM

6) Run the p_manage_18 steps in a production run with the MGU11 ue_11 stopped.

Load the new file with p_manage_18:
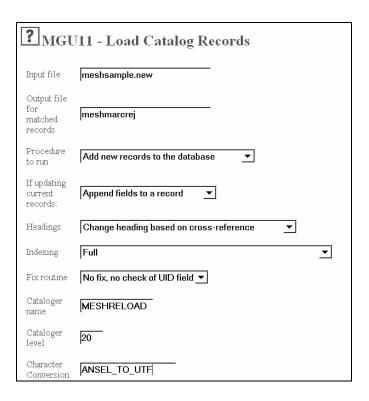   add new records
      full indexing
      ANSEL_TO_UTF (character conversion to Unicode)
      update headings according to cross-references
      CAT: MESHRELOAD

? MGU11 - Load Catalog Records

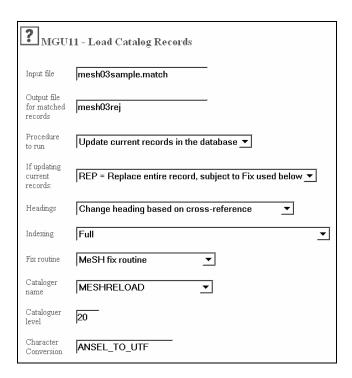|	
Input file	meshsample.new
Output file for matched records	meshmarcrej
Procedure to run	Add new records to the database ▼
If updating current records:	Append fields to a record ▼
Headings	Change heading based on cross-reference ▼
Indexing	Full ▼
Fix routine	No fix, no check of UID field ▼
Cataloger name	MESHRELOAD
Cataloger level	20
Character Conversion	ANSEL_TO_UTF

7. Overlay the changed records with p_manage_18:
   replace records
   MESH merge profile
   (tab_doc_merge profile 03 and fix_doc_preferred to create COR if the 1xx changes)
   CAT: MESHRELOAD

```
?  MGU11 - Load Catalog Records

Input file          mesh03sample.match

Output file
for matched         mesh03rej
records

Procedure
to run              Update current records in the database ▼

If updating
current             REP = Replace entire record, subject to Fix used below ▼
records:

Headings            Change heading based on cross-reference        ▼

Indexing            Full                                           ▼

Fix routine         MeSH fix routine        ▼

Cataloger
name                MESHRELOAD             ▼

Cataloguer
level               20

Character
Conversion          ANSEL_TO_UTF
```

IV. Indexing Considerations After an Initial MeSH Reload

MGU11 will re-index itself online, using the new index tables. This includes short-doc, and see also 550 links between authority records (Z103) created by tab07.

Alpha long headings (p_manage_17) is scheduled as a weekly job in MGU11 (ran 7hrs).

To make sure the SUM index links to new MeSH authority records, let the MGU11 Z07 (queue of authority records waiting to be indexed) finish completely before turning the MGU11 ue_11 (messaging) back on. This will trigger appropriate updates in the MGU01 Z07 and updates to subbases to process by p_manage_34. It took 4-5 days to run.

Note that the version of p_manage_18 needs rep_change 4011 (post-patch 7) to force a Z105 to be written for each authority record.

a) Run p_manage_18 specifying "Indexing = FULL" with the MGU11 ue_11 stopped and with the MGU11 ue_01 running.

b) Wait until the MGU11 ue_01 has processed all the Z07s. (Do "select count(*) from z07;" to verify.) You should now see that one MGU11 z105 record has been created for each input authority record.

c) Start the MGU11 ue_11. (The MGU01 ue_11 and ue_08 also need to be running at this point.)

The new cascade of 600/610/611/630 in the SUM index to MGU10 will only take effect for headings on bibliographic records that the system tries to update for another reason during the indexing of the new MeSH. Having ue_08 recheck the headings can only be done for all of MGU01, not just for the SUM index. To get that linking complete, we will have to wait for the next complete reindexing.
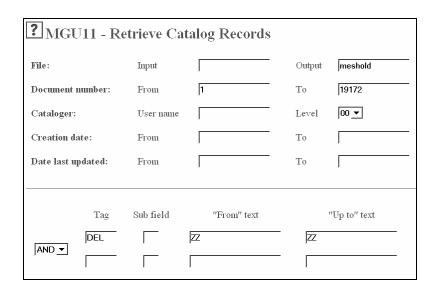

IV. Post-load Authority Record Cleanup After Initial Reload
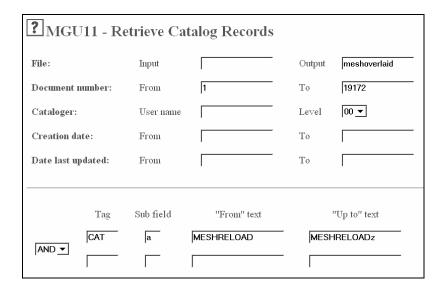
a) Obsolete MeSH Authorities

Delete records in MGU11 that are no longer in the NLM file. This will include both obsolete heading/qualifier combinations and any main heading records that have become obsolete. I did this first, so staff would not use obsolete MeSH authorities by mistake.

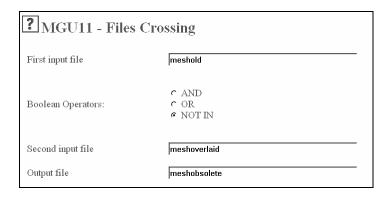Selecting the records to delete requires 3 steps:
1. Use ret_01 on the record number range presently in use, to retrieve all non-deleted records.

2. Use ret_01 again to retrieve all records with a CAT field of MESHRELOAD.

9

MGU11 - Retrieve Catalog Records

File:	Input		Output	meshoverlaid	
Document number:	From	1	To	19172	
Cataloger:	User name		Level	00 ▾	
Creation date:	From		To		
Date last updated:	From		To		

	Tag	Sub field	"From" text	"Up to" text
AND ▾	CAT	a	MESHRELOAD	MESHRELOADz

3. Use ret_10 (cross files) to retain records from file 1 not in file 2.

MGU11 - Files Crossing

First input file   meshold

Boolean Operators:
   ○ AND
   ○ OR
   ◉ NOT IN

Second input file   meshoverlaid

Output file   meshobsolete

There is no way to delete these records from MGU11 in batch, so a list must be printed for manual review.

Pat formatted a list in 2 columns with p_print_08, showing the system number and 1xx. There were 470 records on the list. I searched our catalogue to check and change any bibliographic records with obsolete headings, since the presence of free-floating subdivisions stops headings from being updated. It turned out that we had duplicate authorities caused by NLM changing system numbers for headings. We had also typed in a few authorities by hand without adding 035s. The obsolete authorities were deleted manually. I made a list of the straightforward deletes for database maintenance staff. These were usually combination records with age group subdivisions and no corresponding bibliographic records. It was easier for me to drop duplicate authorities, authorities that had changed to see references, and obsolete authorities that were still used in bibliographic records.

Many of the obsolete headings are now cross-references on the new headings, but there are some cases where you have to guess at the new term. For example, I replaced *Filovirus Infections* with *Filoviridae Infections*, *Prednisolone, Topical* with *Prednisolone* and *Administration, Topical*, and *Anabolic Steroids* with *Anabolic Agents*.

b) Changed MeSH Authorities, COR Report

Use ret_01 to find all records with a COR tag, then p_print_08 to format in 3 columns: the system number, the heading, and the COR tag. I checked 337 headings for bibliographic records that had not been automatically updated.

? MGU11 - Retrieve Catalog Records

File:	Input		Output	meshwithcor
Document number:	From		To	
Cataloger:	User name		Level	00 ▾
Creation date:	From		To	
Date last updated:	From		To	

	Tag	Sub field	"From" text	"Up to" text
AND ▾	COR			

? MGU11 - Print Catalog Records - Columnar Format

Input file	meshwithcor
Output file	meshflipped
Columns in report	System Number	Heading	COR tag ▾
Report language	English ▾
Title of Report	MeSH 1xx changes
Header/Footer	Special Report ▾

There were a few problems. *Ubiquitin* was a COR tag on the record for *Ubiquitins*, yet both headings are valid with *Ubiquitin* being the more specific term. *Blacks* was a COR tag on the record for *African Americans*, yet there are no 450s on that heading. *Blacks* is a see reference to *African Continental Ancestry Group*. So *Blacks* was switched to that term, but by looking at the titles, you could see that many of the books were about *Blacks* in the United States and

11

would be better under the heading *African Americans*. *Medicine, Herbal* was a COR tag on the record for *Phytotherapy*, yet both headings are valid. (NLM makes some of their rare see also references to direct users from the specialty to the therapy.) *Medicine, Herbal* now means the specialty alone and not both the specialty and the therapy. The therapy part of the heading is given its own term: *Phytotherapy*. It was the same with *Acupuncture* and *Acupuncture Therapy* and *Physical Therapy (Specialty)* and *Physical Therapy Techniques*.

NLM tends to use a descriptor to represent many concepts, not all of which are synonyms. As a concept appears more and more in the literature, it is no longer subsumed under a broader term, but given its own descriptor. Remember that they can do anything they like with their 035s, and that they're not thinking of how reusing 035s or changing them for the same terms affects us.
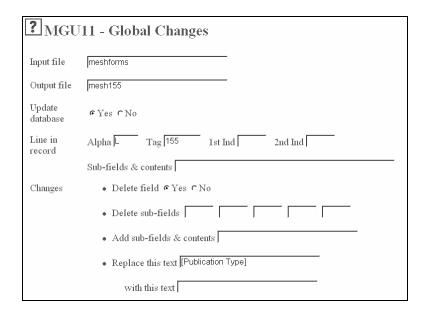
I found 2 small errors in the MeSH file. NLM has a new heading in 2004 MeSH, *Rehabilitation of Hearing Impaired*, but the older form *Hearing Impaired Persons $x Rehabilitation* still exists. Alice Jacobs at NLM let me know that they would use only the former term now, and that they were deleting authorities for *Mental Disorders Diagnosed in Childhood*, since this term may not be used for either indexing or cataloguing.

When this report was finished, Pat deleted the COR by global change.

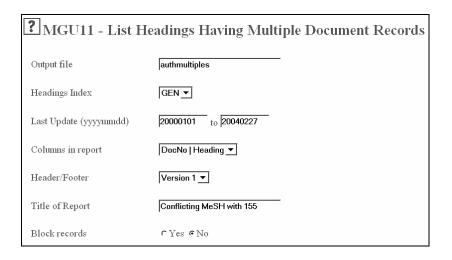c) Publication Types Global Change

Pat ran global changes on 155, 455, 555 tags to get rid of the [Publication Type] text string, which prevents any sort of matching and causes problems when selecting a heading from the indexes while cataloguing. The global changes resulted in some 155 headings being identical to 150 headings, so the 155s must be UPD=N. Also, some 155s will be identical to 455s on the same record. These authority records are the only ones where we need to make a McGill adjustment to the authority records NLM issues.

MGU11 - Global Changes

Input file	meshforms
Output file	mesh155
Update database	⊙ Yes ○ No
Line in record	Alpha L Tag 155 1st Ind 2nd Ind
	Sub-fields & contents
Changes	• Delete field ⊙ Yes ○ No
	• Delete sub-fields
	• Add sub-fields & contents
	• Replace this text [Publication Type]
	with this text

d) Conflicts and Ambiguous 4xx

Run p_auth_04 only after error reports 1 and 2 are completed. These steps also require that the indexing process in MGU01 be complete.

Run p_auth_04 (conflicting authorities) to find any conflicts and ambiguous 4xx. The authorities to delete report must have already been completed; otherwise many entries on this report duplicate that one. NLM's policy is to make the 450s unique, so a correctly-processed file should not have these errors. (Note: some 155s have the same heading as 150s, and although this is legitimate, they will show in the report.) This step completes the cleanup of the authority file itself.

MGU11 - List Headings Having Multiple Document Records

Output file	authmultiples
Headings Index	GEN ▾
Last Update (yyyymmdd)	20000101 to 20040227
Columns in report	DocNo | Heading ▾
Header/Footer	Version 1 ▾
Title of Report	Conflicting MeSH with 155
Block records	○ Yes ⊙ No

e) Bibliographic Records Under a 4xx

Run p_print_05 on the SUM index in MGU01 to find bibliographic records under a 4xx. As only 155 headings are UPD=N, there are very few. Authority records where the 155 after removal of [Publication Type] match a 455 show on this report, and the 455 needs to be removed. We ended up with 17 headings after the 155 publication type global changes. This job is designed as bibliographic file cleanup, and it incidentally finds the 455 authority tag problem.

? MGU01 - Print Catalog Records with "Non-preferred" Headings

Output file	mes4xx
Headings index:	SUM ▾
"From" text	
"To" text	
Columns in report	Acc Text | Acc Documents | Title ▾
Format of documents	Short-Doc title ▾
Header/Footer	Open Report Type 1 ▾
Title of Report	Bibs under a 4xx -- MeSH

V. Continuing to Clean Up the Bibliographic File

a) OCLC Lacey Authority Processing

We had sent out a range of system numbers to OCLC Lacey for authority processing last year in April, and I had gone over two error reports from them, one listing headings that did not match at any level, and one listing headings that were a partial match. These reports highlighted the many cases were we had used *$x history* and it was no longer allowed: terms like *Cultural Diversity*, *Dreams*, *Emotions*, *Gender Identity*, *Memory*, and *Politics*. Other descriptor/qualifier combination records are no longer allowed or were never correct, such as *Taxus $x therapeutic use* (NLM prefers *Plant Preparations $x therapeutic use* plus the particular plant entered alone), *Quality Control $x methods*, *Pain $x physiology, Child Behavior $x education.* It looks as if NLM is simplifying their subdivision practices, and many more headings may no longer have any allowable qualifiers. The OCLC Lacey manual review helped clean up a portion of our catalogue, but the whole catalogue needs work. We want to run

p_auth_03 (find bibliographic headings with no authority) on the SUM index in MGU01 to check for any remaining bibliographic records with headings that are no longer valid in MeSH.

b) Problem with P_auth_03

This program works on the index file only and does not check whether the index entry is live (has a bibliographic record) or a dead "phantom" entry for something that was previously corrected. So most of the blatant errors on the list are in fact not there.

Larry Deck submitted this problem as PRB 6970 on Nov. 12, 2003. Jerry Specht suggested p_manage_15 needed to be run to "clean up" the index file first. However, testing confirmed that this job deletes index entries that are in fact needed (main headings without bibs where the bibs appear with a subdivision). On Dec. 5, we sent this back to ExLibris.

It is not practical to just use the report as is and have staff ignore the phantoms: in our test database after the test 2003 load, the report was 1,489 pages long, mostly listing phantom entries.

If MGU11 did not have all the decriptor/qualifier authorities, this report would be even larger, since each combination would appear in the report. All the combinations would be reported every time we run the report as part of ongoing MeSH maintenance, even though the heading is only a problem if the unqualified main heading is also on the report. There is no option to reduce the report. Free-floating form, geographic, language, and age group subdivisions will appear anyway.

Also, our SUM index contains 600/610/611/630 headings that use the LC NAF form of heading. These fields have not previously been linked to MGU10, so, unless the update process links them, they will all appear on the report. As an added bonus to revisiting MeSH and the SUM index, we have been able to set up tab_aut and tab20 to cascade the SUM index to MGU10 if the heading does not match in MGU11. This should result in the name headings cascading, but generally not the topical and form headings as they will first match in MGU11. This will bring useful references into the SUM index for the public (as well as improve reports for maintenance), although it will only take effect later because we will not be reindexing the bibliographic file specifically for this purpose.

VI. Fixing Problems Created in 1999

As an alternative to auth_03, I noted changes to free-floating subdivisions and used keyword searching to find obsolete forms in our bibliographic records. Pat used ret_01 to find the ones that were hard to locate with keyword searching, and she fixed them by global change.

Most changes to free-floating subdivisions seem to have taken place in 1999 when NLM's Cataloging Section moved to harmonize its practices for subject heading content and structure with the library's indexing practices. The changes coincided with the implementation of the Voyager Integrated Library System, and the new practices are outlined in a document entitled *Application of MeSH for Medical Catalogers* (http://www.nlm.nih.gov/tsd/cataloging/catmesh.html).

These instructions apply to the 1999 issue of MeSH, and it's important to read the new instructions issued each year. (See http://www.nlm.nih.gov/mesh/catpractices2004.html).The Cataloging Section updates *Application of MeSH for Medical Catalogers* regularly, however, they don't guarantee that the text is as current as the MeSH authority file. Use this manual to understand new NLM policy while relying on the MeSH Browser as the final authority on MeSH terms. For example, *Case Report* is described as a Publication Type used as a form division, but it is listed as *Case Reports* on the MeSH Browser. The MeSH Browser lists *Adolescent* as one of the age groups, but the manual uses the term *Adolescence*.

So, what were the major changes that took place in 1999? Well, basically NLM moved from a pre-coordinate system to a post-coordinate one. They no longer use a conventional subject heading string; geographic descriptors, publication types, age groups, and languages are all entered in separate fields, and recombined in MARC records distributed to OCLC. In order to do this, the library changed the form of many of these terms. *Form Subdivisions* were renamed *Publication Types*. The manual includes a table of obsolete form subdivisions and their corresponding publication types. The form subdivisions used to be entered in lowercase as $x. Some were changed from plural forms to singular forms, for example, *$x dictionaries* changed to *$v Dictionary.* Others were changed more radically, such as *$x case studies* to *$v Case Reports.* Others representing the physical carrier of the information were dropped, examples include *$x CD-ROM*, *$x microfiche*, *$x electronic journals.* Note that *$x societies* is now entered as *650 Societies.*

Some pre-coordinated main headings used to identify forms: *Dictionaries, Medical* and *Bibliography of Medicine* may still be used, but now only for works about these topics, about how to write a medical bibliography. Now medical bibliographies are entered under *650 12 $a Medicine $v Bibliography*. Of course the geographic subheading comes before the $v, so you can't do a global change to catch all of these obsolete terms. To

add to the confusion, Publication Types are divided into two kinds: those that may be appended to the subject heading string (PTs used as form divisions) and those that may not (PTs used as genres and entered as 655s on OCLC).

Another important change is that age groups and *Pregnancy* replace "in … " phrase topical subheadings, such as *$x in infancy & childhood*, *$x in adolescence*, *$x in adulthood*, *$x in old age*. The age groups may be used as topical subdivisions; they are now capitalized and are basically free-floating in that NLM no longer establishes them as descriptor/qualifier combination records. There is a finer division of age groups now, and the cataloguer is advised that they can be used anywhere except with main headings that repeat the age group, for example, don't put *650 12 $a Disabled Children $x Child.*

The end result is that many updates are required in OPACs since 1999. You can change old authority records like *Physiology $x in infancy & childhood* to *Physiology $x Child*, to get the headings to flip in the bibliographic records. Then delete the authority record, since NLM no longer establishes any age groups in descriptor/qualifier combinations. Some changes cannot be processed so easily. For example *Death, Sudden $x in infancy & childhood* is now covered by *Sudden Infant Death*, and the latter term has no cross-reference from the former. Cross-references are included in the MeSH authority records for cases such as *Cells $x physiology* use *Cell Physiology* or *Hip Joint $x injuries* use *Hip Injuries*. If in doubt, consult the MeSH Browser since it has links to related headings and the indexing manual.

I used keyword searches in Subjects to find some of the obsolete subdivisions in our bibliographic records. Distinctive obsolete subdivisions, such as *$x videocassettes, $x spectra, $x radiographs, $x nomenclature, $x legends, $x in old age* were relatively easy to find this way. We cannot do keyword searches in MeSH headings alone, so terms such as *$x in adolescence* gave many hits in LCSH (there's actually an LCSH for *Executive ability in adolescence*). It was better to do global changes to find the ones only in MeSH. Pat did global changes to convert *$x in adolescence* and *$x Adolescence* to *$x Adolescent.* She also changed *$x case studies* and *$v Case Report* to *$v Case Reports*. The last example alone fixed about 800 entries. Pat printed out a list of bibliographic records that had *$x societies.* These entries had to be changed to the main heading *Societies* or a narrower term, as shown in the MeSH Tree Structures. Note that global changes of MeSH often need to be repeated because MeSH may have indicators _2, 12, or 22. NLM uses the first indicator to say whether a subject heading is entered at the primary or secondary level.

VII. Conclusion

Our bibliographic and authority records are much easier to use now than ever before, although there are still errors. Some errors are hard to find, and others are made because we can't afford to actually look at the book to decide on a new MeSH term. We are often guessing from the title. It's important to check NLM's LocatorPlus if you really get stuck during post-loading cleanup. NLM staff also had to fix their records, and you can see the decisions and shortcuts they made. We look forward to having auth_03 working so that we can get a clearer view of bibliographic headings without authorities. The program could be an excellent aid as we move this year to train more cataloguing staff in using MeSH. Please feel free to e-mail me or Pat Riva if you have any questions about this report.

Karen Jensen, Science Cataloguing Librarian, karen.jensen@mcgill.ca.

Pat Riva, Romance Languages Cataloguing Librarian / Bibliographic Database Specialist, pat.riva@mcgill.ca