Mineral identification numbers for librarians, explained through a short history of Dana's classification scheme

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First, a little geology and chemistry

What is a mineral?

- Not the same as rocks
  - Rocks are composed of minerals
- To be a minerals
  - **Set chemical formula for minerals**
  - Naturally occurring
  - Solid
  - Set crystalline structure
  - Inorganic

Granite

Quartz, SiO_2

Photos from mindat.org

Chemical Identifiers

- Help solve a problem with chemicals
  - There are many names for a single chemical
    - Even in the same language
    - Variant spellings
- The problem complicates literature searches
  - Chemistry librarians should be aware of them
- Solutions
  - Unique IDs
    - CAS registry numbers
    - InchI strings

Now, for mineral identifiers

Mineral Identifiers

- Minerals have similar naming obstacles
- Less well known and less utilized in literature than chemical identifiers
  - More frequently used by mineral collectors
- Several classification schemes
  - Hey's Chemical Index of Minerals Ref
  - Strunz-mindat
  - **Dana's**

Dana's System of Mineralogy

Edition	Publication Date	Primary Authors
1	1837	J. D. Dana
2	1844	J. D. Dana
3	1850	J. D. Dana
4	1854	J. D. Dana
5	1868	J. D. Dana & G. J. Brush
6	1892	E. S. Dana
7	1941	C. Palache & C. Frondel
8	1997	R.V. Gaines, et al.

J.D. Dana & Brush we both professors at Yale

J.D. Dana's son

This was the book series that classified minerals and assigned them an identification number

Evolution of the System

- Over time it migrated away from a flat schema to a hierarchical one
- This provides information
  - Moving left to right it goes from broad categories to narrow
- It's more flexible when adding or removing minerals
  - No need to reassign numbers

	5th Edt. (1868)	8th Edt. (1997)
Quartz	231	75.1.3.1
Halite	138	9.1.1.1
Pyrite	75	2.12.1.1
Diamond	24	1.3.5.1
Graphite	25	1.3.6.2

Quick Example

In both editions, they are grouped into families, so like is with like

Diamond and graphite both have the chemical formula C

	5th Edt. (1868)	8th Edt. (1997)
Diamond	24	1.3.5.1
Graphite	25	1.3.6.2

Diamond

Graphite

Photos from mindat.org

Why is this useful to know?

- Interesting to see how the scheme persisted and evolved
  - Tracing mineral discoveries
  - Changes to how it's described
  - Re-classification
- On a practical level, knowledge of the schemes can aid in mineral collection maintenance or rescue
  - Dana numbers have been used by collectors for many decades

Used by collectors for arranging

Older mineral collections could be cataloged, or even arranged by Dana numbers

Being aware of what they are, an essential metadata element, is beneficial to this kind of work.

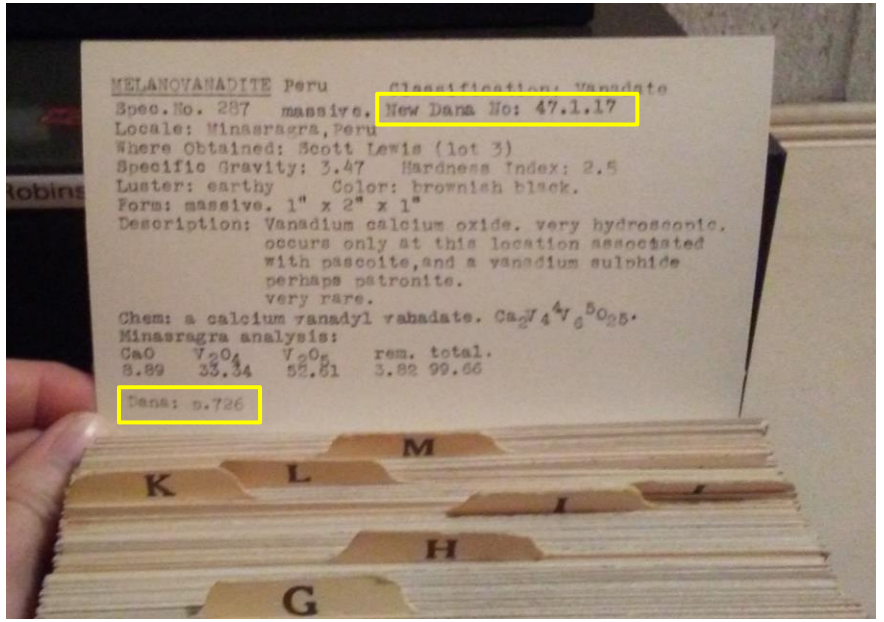

Photo from Kristen Adams

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Take-a-ways

- Introduce the topic of mineral identifiers
  - Chemical identifiers as a launch pad
- Focus on Dana's classification scheme
  - Authored other book series and many articles

Danalite, $Be_3Fe^{2+}_4(SiO_4)_3S$, Dana 8th ed.: 76.2.4.2

Photo from mindat.org

Thanks for listening

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