

**A Review of Formatting Style in
the
*American Museum Novitates***

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Abstract:

This research document plots the stylistic changes of the American Museum Novitates since its inception in 1921. There have been several Novitates style guides published, the first in 1943, the last in 2002, but there has been no definitive description of how the publication has changed its editorial rules over the years. In fact, at this writing we are unaware of any such analysis of an established series in Biological systematics. This analysis was undertaken to assist in an ongoing National Science Foundation project looking into the feasibility of automated markup of such documents based on structural cues. Using our hypothesized Taxon-X schema (derived from the implicit structure of scientific publications in biological systematics) and other schemas under development we hope to use the uniformity in structural publishing formats across the contemporaneous literature and stability within individual series over time to create successful markup tools. This project has chosen to focus on publications in the discipline of entomology, and so that will also be the test bed for this paper.

Layout:

Page Layout:

The layout of the pages have switched between a single and double column structure.

1921 – 1938: Single column format

1939 – 1947: Double column format

1948 – 1973: Single column format

1974 – 2004: Double column format

Page Sections:

Introduction:

1921 – 1947: No introduction section noted

1948 – 1949: Introduction section is noted

1950 – 1959: No Introduction section noted

1961 – 2005: Introduction appears in some, not all, Novitates.

Abstract:

1921 – 1925: No abstract section noted

1925 – 1969: Abstracts appear in some titles, often including a table of species, a list of species, a key to genera or species, or a key to males and females.

After 1970, each author is required to submit an abstract (style guide 1970.) Abstracts often contain the number of species to be described in the text.

References:

1921 – 1942: References are incorporated into the text

1943 – 1971: Headers are inconsistent from one paper to the next. *References, List of References, Selected References, References to the Literature, Literature Cited, Bibliography, and Selected Bibliography* are all noted.

1972 – 1987: *Literature Cited* is the header towards the end, or at the end of the text.

1987 – 1988: *Literature Cited* is changed to *References Cited*.

1989 – 2004: *References Cited* is changed to just *References*.

Paragraph Layout:

Paragraphs are indented throughout all titles.

Formatting:

Font Style:

1921 – 1947: Times New Roman

1948 – 1953: An unidentified font characterized by spikier serifs than Times New Roman

1954 – 2004: Times New Roman

Font Size:

1921 – 1922: 10 and 12 point size

1923 – 1924: 8, 10 and 12 point size

1925 – 1935: 10 and 12 point size

1936 – 1937: 10, 11 and 12 point size

1938 – 1941: 8, 10 and 12 point size

1942 – 1943: 8 and 10 point size

1944: 8, 10 and 12 point size

1945 – 1947: 10 and 12 point size

1948 – 1953: 10 and 14 point size (not TNR)

1954 – 1971: 10 and 12 point size

1972 – 1973: 10, 12 and 14 point size

1974 – 2004: 10 and 12 point size

Semantic Elements

Taxonomic Treatments:

Within the sciences, publishing tends to adhere to more formally procedural (if not tabular) standards for publication. Within the biological systematics community, published descriptive treatments of taxa (taxonomic /or taxon treatments) must conform to generally recognized standards to constitute a valid original description or revision. Such treatments are described, among other places, in J. Winston's *Describing Species*. The taxon treatment object describes, among others, the following kinds of information, each marked in a way that can be extracted by an application:

- **Taxon-name.** The accepted or valid scientific name.
- **Authority.** The details of the publication of the currently accepted (valid) name of the taxon.
- **History/Synonymy.** References to publications of the previous names if this is a revision. materials studied. The actual specimens examined for the treatment, with brief descriptive data. "Two general forms of synonymy are in use. Both are essentially chronological, but one stresses the chronology of the synonymic names and the other the chronology of the bibliographical reference¹."
- **Diagnosis.** A treatment typically contains the key diagnostic features, or characters of the organisms, that allow the taxon to be distinguished from others
- **Descriptions.** Taxon treatments often contain additional information about the organisms being treated; this information may include descriptive details that are not immediately relevant to diagnosis (such as ecological descriptions about habitat, behavior or relationships with other organisms).
- **Keys.** Identification aids, usually linked to taxon names at a variety of hierarchic levels;
- **Figures.** Illustrations of morphology of other information usually associated with taxon names
- **Biotic Associations.** Information on host associations, e.g., plants.

Throughout the *Novitates* collection, there are references to taxonomic names. There has been consistency in the formatting of these names depending on what the author wanted to convey, and the guidelines the editors enforced. Unfortunately, even with a strict set of guidelines, discrepancies have been noted, even within the same body of work.

A taxonomic treatment starts with a header of that species name that refers to a new collection or revision of that species. It is centered in the column and the text is in bold or italics. They are sometimes followed by a comma (discussed below) and then by:

1. new species
2. new variety
3. new sub species
4. authority – sometime in parenthesis
5. new genus

For a new species:

¹ *Procedure in Taxonomy*. E. Schenk & J. McMasters. Oxford University Press 1936. p15

1921 – 1953: Taxonomic name header appears in bold.

1954 – 1957: Taxonomic name header appears in italics.

1958 – 1984: Taxonomic name header appears in bold.

1985 – 2004: Taxonomic name header appears in italics.

The header for a known species is treated similarly: centered in the column and either bolded or italicized. It is followed by the name of the discoverer (describer?), unbolded, frequently in parentheses.

For a known species:

1921 – 1953: Taxonomic name header appears in bold.

1954 – 2004: Taxonomic name header appears in italics.

The header for a new genus follows the same pattern: centered in the column and bolded or italicized. It can appear in all caps, small caps (HEADER) or mixed case. It is followed with a comma and the words “new genus”, also sometimes in caps or small caps. After 1993, the discoverer’s name sometimes appears after the header and before the comma in plaintext.

For a new genus:

1921 – 1947: Taxonomic name header appears in bold and small caps.

1948 – 1971: Taxonomic name header appears in bold and all caps.

1972 – 1993: Taxonomic name header appears in italics and all caps.

1994 – 1998: Taxonomic name header appears in italics and mixed case.

1999 – 2001: Taxonomic name header appears in italics and all caps.

2002 – 2004: Taxonomic name header appears in italics and mixed case.

Known genera are treated similarly to known species with a header usually followed by their discoverer’s name, often in parentheses, usually following the same case format as the header. Following 1949, the header is increasingly often prefixed with the word “GENUS” although it remains optional. After 1995 the discoverer’s name is often followed by a comma and the date of discovery.

For a known genus:

1921 – 1922: Taxonomic name header appears in bold and mixed case.

1923 – 1947: Taxonomic name header appears in bold and small caps.

1948 – 1953: Taxonomic name header appears in bold and all caps.

1954: Taxonomic name header appears in italics and mixed case.

1955 – 1996: Taxonomic name header appears in italics and all caps.

1989 – 2004: Taxonomic name header appears in italics and mixed case.

The final two styles co-exist for several years.

The body of a taxon treatment is broken up into sections like those described above as well as a host of others. These headers are dependent on the species type, and what the author is studying about this species. These headers appear in uppercase except between 1974 and 1977 where they appear in lowercase, and italicized. They are followed by an m-dash from 1921 to 1943, and a colon from 1944 to 1973 and 1978 to present day:

Header Formatting:

1921 – 1943: HEADER.—

1944 – 1973: HEADER: (sometimes with a space between the header and the colon)

1974 – 1978: *Header*.

1979 – 2004: HEADER:

Header Types:

The following is a list of descriptive headers related to Entomology, their duration of use, and their frequency are indicated. Please note that the dates are subject to sampling error; the true ranges may be somewhat greater and extensive periods of disuse may exist between the earliest and latest usages.

ADULT MALE/FEMALE.— [1922 – 2004] : **Occurs frequently (see graph below)**
WORKER/SOLDIER.— [1922 – 1982]
FEMALE (deälated).— [1922 – 1929] [example: #N0349]
FEMALE (ALATE): [1949 –] [example: [#N1396]
DEALATE FEMALE & FEMALE (DEALATE): [1950 – 1952] [example: #N1465]

Each species is based on a single type specimen, this at least in theory . The description of the type is literally the verbal description of the type. Type material is just the entirety of holotype, paratypes, lectotypes, syntypes, etc. i.e. physical specimen.

TYPE.— [1921 – 2004] : **Occurs frequently**
GENOTYPE.— [1921 – 1957]
DESCRIPTION OF TYPE. — [1940 – 1978]
PARATYPES: [1952 – 1992]
TYPE SPECIES: [1985 – 2003]
SPECIMEN (NEOTYPE): [1997]
HOLOTYPE: [1950 – 2003]
TYPE MATERIAL: [1940 – 1995]

Material examined refers to the physical specimen included in the study. All the specimen, for example, belonging to a particular species mentioned in the study. Species included are the species, which are based on the specimen. Other material is opposed normally to material other than type material, that is additional material.

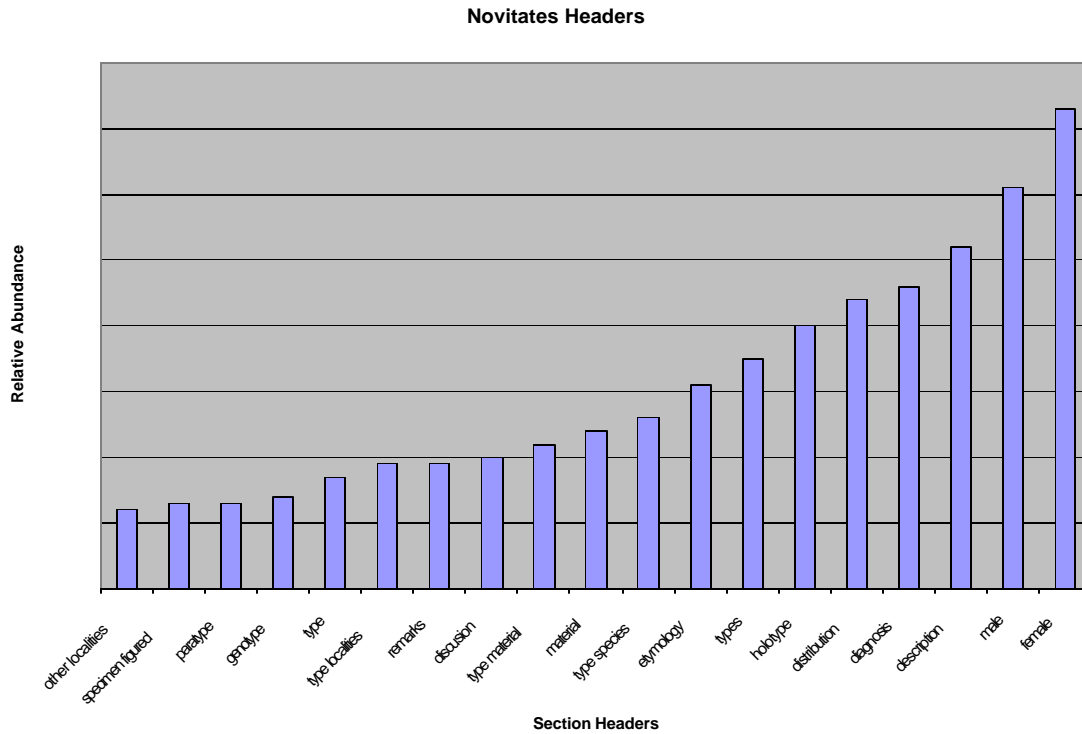
MATERIAL EXAMINED: [1945 – 2004]
SPECIES INCLUDED or INCLUDED SPECIES: [1996 – 2003]
SPECIES EXAMINED.— [1921 – 1928]
OTHER MATERIAL EXAMINED: [1984 – 2004]
MATERIAL STUDIED: [1969]
MATERIAL. — [1935 – 1944]

Distribution means the geographic range of the species. Habitat is the biological content of the distribution range, where a species occurs. Locality is the place, where a specimen of a species has been collected. Range is the geographic distribution of species. Type locality is the place, where the species has been collected which upon which the description of the species has been based. Nowadays, it is the place where the *holotype* has been collected (see above). Occurrence = Expanse = distribution range

DISTRIBUTION.— [1921 – 2004] : **Occurs frequently**
DISTRIBUTION AND HABITAT: [1982]
LOCALITY.— [1921 – 1932]
RANGE.— [1921 – 1978]
TYPE LOCALITY. — [1936 – 1975]
OCCURANCE. — [1942]
EXPANSE: [1940 – 1947]
COUNTRY NAMES SUCH AS: TRINIDAD: [1950 – 2004]
RECORDED DISTRIBUTION: [1948 – 1956]
LOCALITY AND SPECIMENS: [1965]

The following terms mainly refer to structural rather than systematic terms in the publications.

DIAGNOSIS.— [1921 – 2004] : **Occurs frequently**
DESCRIPTION.— [1921 – 2004] : **Occurs frequently**
HORIZON.— [1922 – 1970]
MEASUREMENTS.— [1921 – 1940]
SUB/FAMILY/GENERAL/SPECIFIC CHARACTERS.— [1921 – 1969]
MEASUREMENTS OF TYPE.— [1921 – 1940]
REMARKS.— [1935 – 1994]
DISCUSSION: [1951 – 2003]
COMMENTS: [1987 – 2003]
SYNONYM: [1950 – 2004]
COMPARISONS: [1957 – 1982]
ETYMOLOGY: [1972 – 2004]
RELATIONSHIPS: [1963 – 1985]
MAJOR: [1927 – 1965]
BIOLOGY: [1980 – 2001]
VARIATION: [1968 – 1999]
NATURAL HISTORY: [1975 – 2000]
NOTE or NOTES: [1924 – 2001]
METHODS: [1997]



The graph above illustrates the relative occurrence of headers in Novitates entomology papers. There were also many other headers that did not appear frequently enough to be included. The full study and extensive list can be found in the appendix.

The Editors:

1921 – 1926 : Frank E Lutz

1926 – 1927 : Frank E. Lutz & Chester A. Reeds

1927 – 1929 : Frank E. Lutz & Chester A. Reeds & Ethel J. Timonier

1929 – 1935 : Chester A. Reeds & Ethel J. Timonier

1936 – 1941 : Ethel J. Timonier

1942 – 1942 : Ethel J. Timonier & Ruth Tyler

1943 – 1967 : Ruth Tyler

1968 – 1968 : Ruth Tyler & Florence Brauner

1969 – 1975 : Florence Brauner & Ruth Manoff

1976 – 1984 : Florence Brauner

1984 – 2005 : Brenda Jones

Styles Guides:

There have been two published style guides, the first in 1943, and second in 1953. Later style guides were in memo format, and eventually web format. The following were guide entries worthy of note.

The style guide of 1943 states:

- An author's name after a scientific name should not be set off by a comma, if he is the author of the name. If the author quoted is not the original author of the name but is merely quoting the name, insert a comma.
- No headings should be italicized.
- Synonymies should be written in this order:
 - a. scientific name in full in italics,
 - b. author,
 - c. year,
 - d. complete reference (except that titles of serial articles should not be included) closing with a period.

For each new scientific name in a synonymy, start a new paragraph.

The style guide of 1953 states:

- Names of genera, subgenera, species, or subspecies (or races or varieties, or any other sub-form) but of no higher taxonomic category should be underscored (italicized) in the general headings, as well as in the text, but not in strictly taxonomic headings.

The style guide of 1970 states:

- Synonymy: An author's name after a scientific name should not be set off by any punctuation if he is the author of the name. If the author quoted is not the original author of the name but it merely quoting the name, a colon should be inserted.
- Each description of a new taxon **MUST** include a diagnosis of the taxon labeled with a side-heading and placed early in the account for ease of finding.

The style guide of 1985 states:

- Specialized minor headers (especially embedded within a paragraph) may be italic or bold – should be consistent within the article.

Anomalies:

1924:

Order or family name of species appear in some text in bold and centered above taxon name header of species.

1929:

Morphological headers appear (example #N0300:*Carpenter Bees Of The Genus Mesotrichia*) in lowercase, but followed by an m-dash but is not seen in subsequent publications:

1. Head. —
2. Thorax. —
3. Abdomen. —
4. Legs. —
5. Wings. —
6. Localities. —
7. Genitalia. —

1947:

Taxon name is now sometimes followed by a line break before the authority or 'new species' tag.

1985:

Some publications opt to have centered paragraph headers of 'Description', 'Type Material' and 'Discussion', instead of the colon beginning of paragraph method. This is seen in only some publications.

1993:

Some publications opt to have centered paragraph headers of 'specimens examined', instead of the colon beginning of paragraph method. This is seen in only some publications.

Preliminary Review of Peer Publications:

In order to understand the context of changes and whether the pattern described for the Novitates is characteristic of bio-systematics publications in general, it is important to compare to other publications from similar scientific bodies to see how their styles and formatting have changed over the years.

University Of California Publications In Entomology (1917 - present)

Taxonomic name headers are fairly consistent, they appear bold when referring to a new species, and italicized and non bold when they refer to a species already named. During the 30's through the 50's, both are numbered under each genus and left justified. Both before and after, they are unnumbered and centered. Other descriptive headers appear in small caps from 1917 to 1932, usually followed by a period, some with a period and an m-dash. After 1932, these same headers appear in lowercase italics followed by a period and an m-dash. In the 80's the format switches to all caps followed by a period.

However, this publication has similar inconsistencies to that of Novitates, in that taxonomic name headers and other descriptive headers would occasionally not follow of the above mentioned rules. Interesting this seems more apparent in later years, post 1960's.

Smithsonian Contributions To Zoology (1969 – present)

The taxonomic name headers are all in italics and centered, followed by the discoverer's name, "new species" or "new genus" as appropriate in bold. During the 80's, this is followed by a comma and the year of discovery. Description headers are all in small caps and followed by an m-dash. The header *Material* is sometimes used in place of *Materials Studied*. In 1975 and 1976, parentheses are used in place of commas for a species authority.

Bulletin Of Entomological Research. Institute of Entomology (1910 – present)

Taxonomic name headers appear in bold and left aligned until 1990. When two columns were introduced into the text in 1990, the taxonomic name headers switch to italicized and centered. Description headers begin in plain text followed with a period and m-dash in the 10's, a colon or period in the 20's through 40's. Afterwards, the description headers are italicized. They are followed with a colon during the 50's and a period thereafter.

Bulletin of the British Museum (Natural History). Entomology (1950 – present)

1950 – 1952 : Taxonomic headers are in bold, and centered. Descriptive headers are also not present.

1953 – 1988 : Taxonomic headers are italicized, and centered. Descriptive headers are in small caps, and remain so until this decade when they switch to all caps, Although *Materials Examined* sometimes appears as a centered bold header.

After 1990 – 2004 : Taxonomic headers are bold, italicized, but left aligned along with introduction of two columns to the text.

Conclusion:

To the average reader, the texts appear quite standard and consistently edited, but, the selected sample of bio-systematic publications series reveals a pattern of inconsistency in formatting and style structure within the series examined; this pattern is of concern primarily with respect to the use of format and structure in applications of automated processes but computer software does not (yet) have the intelligent capacity to discriminate semantic analogies where such format and structures are inconsistent. Natural language processing tools are under development to tackle this problem; the fact that there is patterned variation within the sampled publications series, suggests that diagnoses such as that here presented can contribute to the design of common solutions.