Diatom nomenclatural rules and best practices

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Introduction

- Number of new diatom taxa growing fast!

- International Code of Nomenclature ("Melbourne Code")
  - Complex language, main articles relatively clear though
  - Many minutely specific rules occasionally overlooked – but affect validity of names!
  - Many rules lack specific detail or instructions

- Following ICN rules does not necessarily ensure good taxonomic practices

Topics covered:

ICN rules

- **Types**
- **Validity**
- **Legitimacy**
- **Nomenclature**

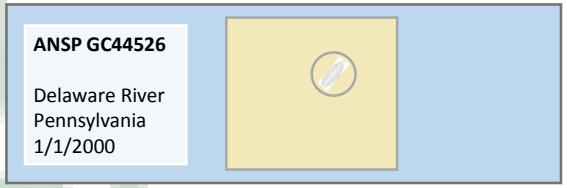
Good practices

- **ICN recommendations**
- **Ideal scenario**

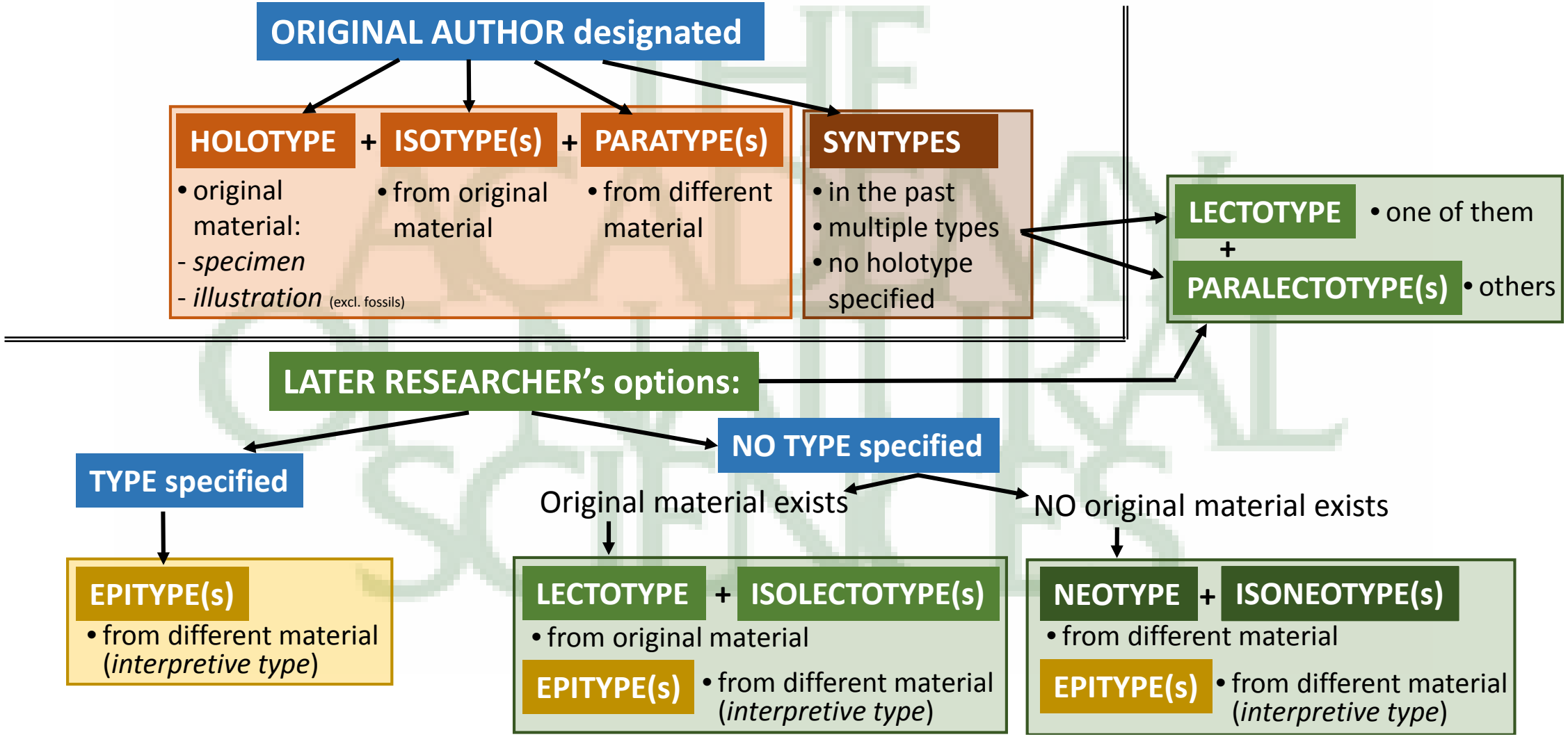
ICN rules: Types

- What is the **type** of a species or infraspecific taxon?
  - "Type must be a specimen" since 2007 (A 40.4, but see exception 40.5)

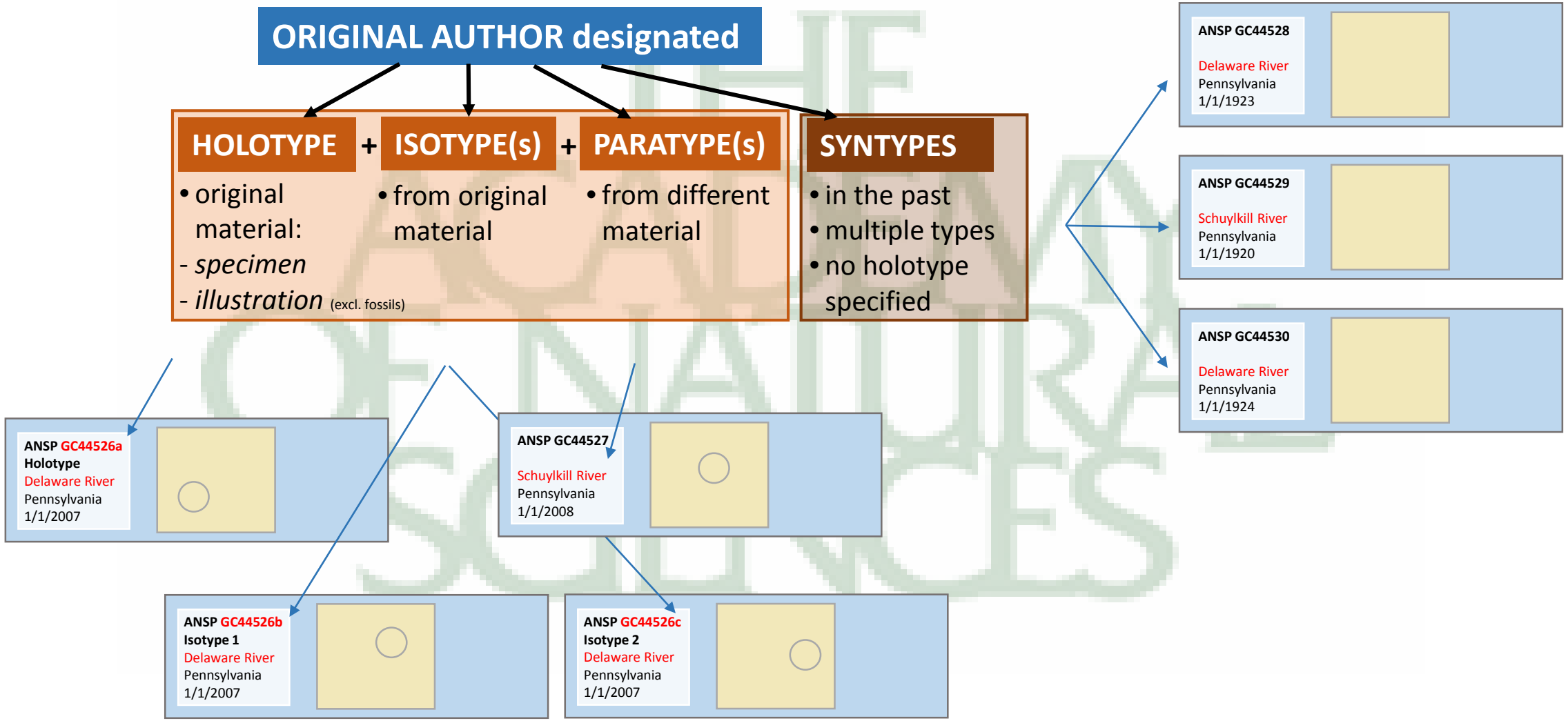
- What is a **specimen**?
  - = "a single gathering of one species" (A 8.2)
  - In a **mixed preparation**: a single valve/frustule
    - If it is not chosen in the protologue, a **lectotype** has to be chosen (A 9.14)
  - A slide can be designated, if a collection is of a **single species**
    - e.g., single mount, culture



ICN rules: Types

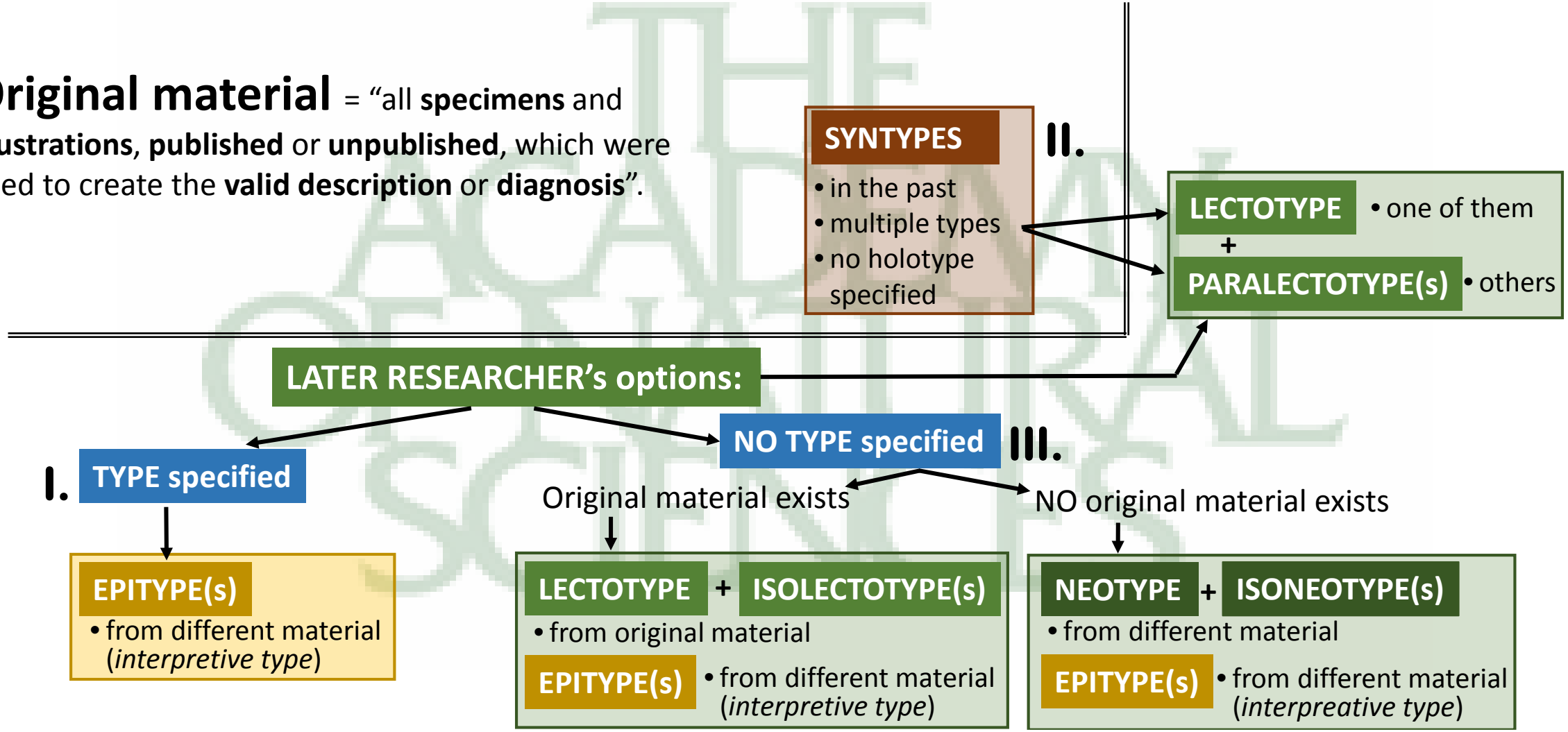


ICN rules: Types



ICN rules: Types

Original material = "all **specimens** and **illustrations**, **published** or **unpublished**, which were used to create the **valid description** or **diagnosis**".



ICN rules: Validity

- What a new species (or infraspecific taxon) needs in order to be valid now:
  - Has to be assigned to a valid genus or species (A 35.1)
  - A holotype has to be designated (A 40.1)
  - Type material has to be conserved in one herbarium or other collection or institution (A 8.1)
  - Description or diagnosis in Latin/English (A 38.11, 39.2)
  - Must include an illustration (A 44.2)
  - Must be “effectively published”
    - distribution of printed matter,
    - Or, since 1/1/2012 on-line (A 29.1)
      - PDF, Online publication must have ISSN/ISBN

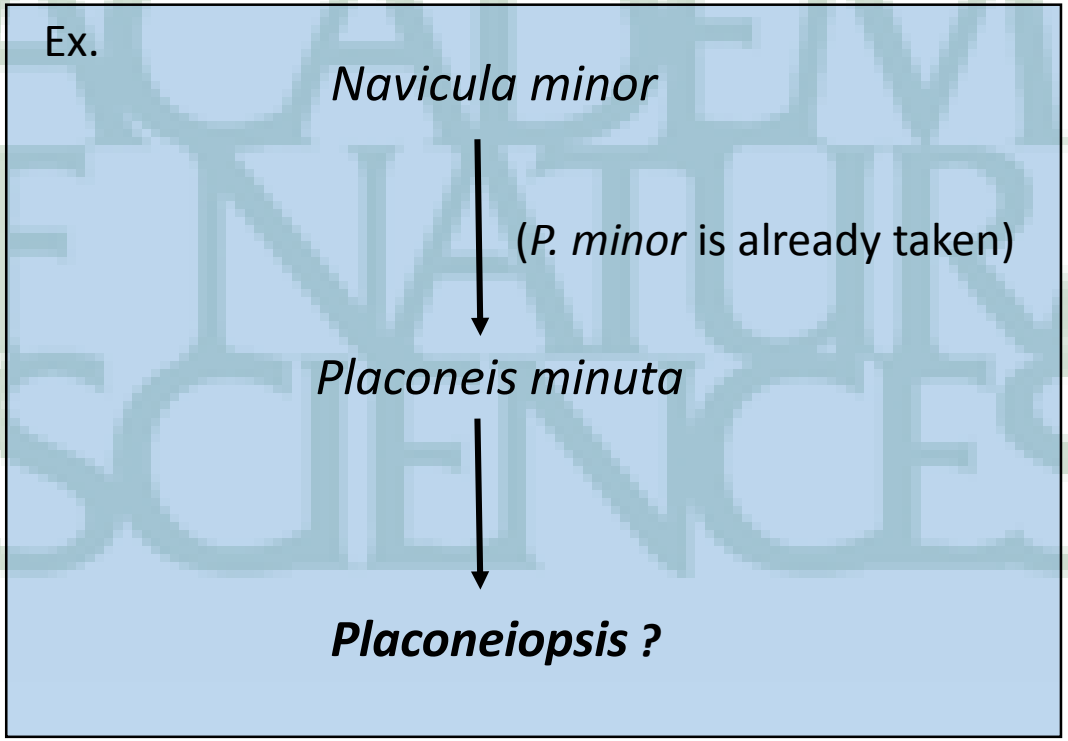
ICN rules: Validity

- New combination and new status
  - Previously validly and legitimately published basionym (A 6.10)
  - Full and direct reference to a basionym (A 41.1, 41.5)
    - Invalid: omission of any part of the reference – author(s), year, journal title, page/fig. number

- New name
  - Previously validly published basionym (does not have to be legitimate)

ICN rules: Validity

- New combination
  - the final epithet has to be the earliest legitimate name of the taxon in the same rank



ICN rules: Validity

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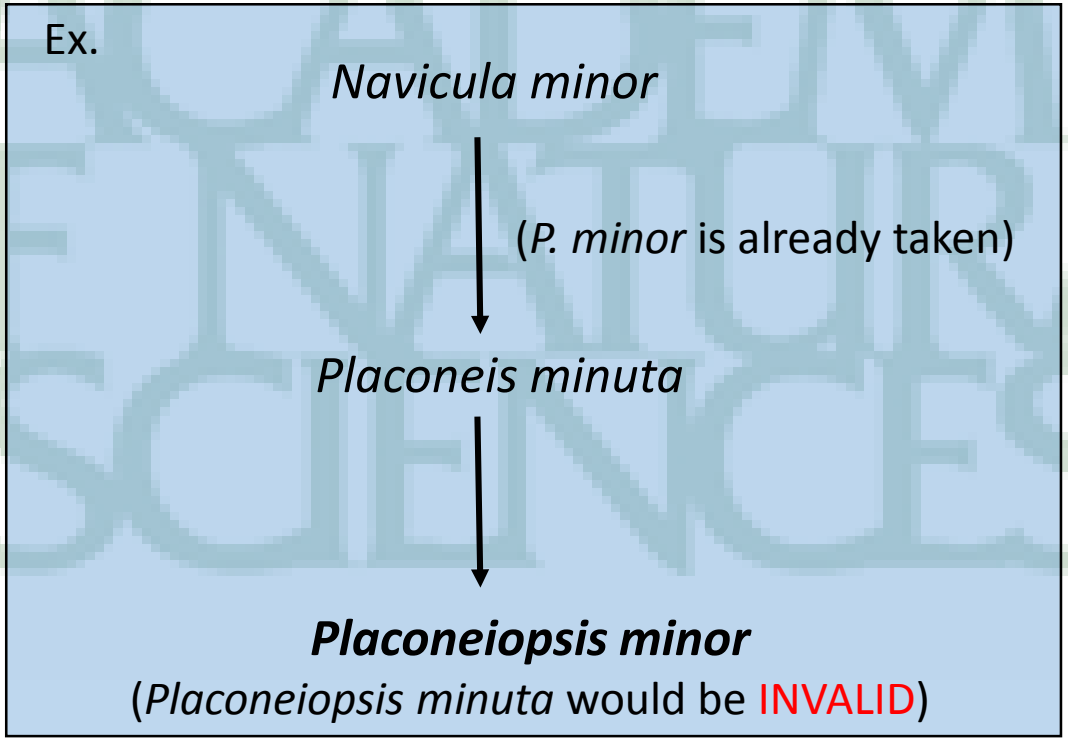


ICN rules: Validity

Rules for diatom names	Art.	–1907	1908–1911	1912–1952	1953–1957	1958–1972	1973–1989	1990–2000	2001–2006	2007–2011	2012–2017
Genus name cannot be a morphological term in use of publication	20.2			✓	✓	✓	✓	✓	✓	✓	✓
Require written description/diagnosis	38.7		✓	✓	✓	✓	✓	✓	✓	✓	✓
Thesis ineffective publication (see notes)	30.8				✓	✓	✓	✓	✓	✓	✓
Clear indication of rank required	37.1				✓	✓	✓	✓	✓	✓	✓
Direct reference to basionym/replaced synonym required (see notes)	41.5				✓	✓	✓	✓	✓	✓	✓
Type must be indicated	40.1					✓	✓	✓	✓	✓	✓
Require Latin description/diagnosis*	44.1					✓	✓	✓	✓	✓	
Must include illustration (see notes)**	44.2					✓	✓	✓	✓	✓	✓
When conditions for valid publication are not simultaneously met, validation publication must make full and direct reference to previous publication/s.	33.1						✓	✓	✓	✓	✓
Herbarium/Collection must be indicated for Type (see notes)	9.22, 40.7							✓	✓	✓	✓
Indication of type must include "typus/holotypus" (see notes)***	40.6							✓	✓	✓	✓
Must use terms "-typus" and "designated here" for lectotypes/neotypes	7.10, 9.23								✓	✓	✓
Type must be specimen	40.4									✓	✓
Basionym/replaced synonym must be directly cited	41.5									✓	✓
Can effectively publish online	29.1										✓
Latin or English description/diagnosis*	39.2										✓

ICN rules: Legitimacy

- Only valid taxa are considered for legitimacy
  - Valid taxa can be legitimate or illegitimate

- Illegitimate:
  - Later homonyms
  - Nomenclaturally superfluous

ICN rules: Legitimacy

Later Homonyms:

Marinaea potapovae 2005 Vs. *Marinaea potapovae* 2016 → **ILLEGITIMATE! (later homonym)**

Type: GC1000a **Type: Boy777**

Janaea veselae **var.** *czechia* 2005 Vs. *Janaea veselae* **f.** *czechia* 2016 → **ILLEGITIMATE! (later homonym)** **A 53.4**

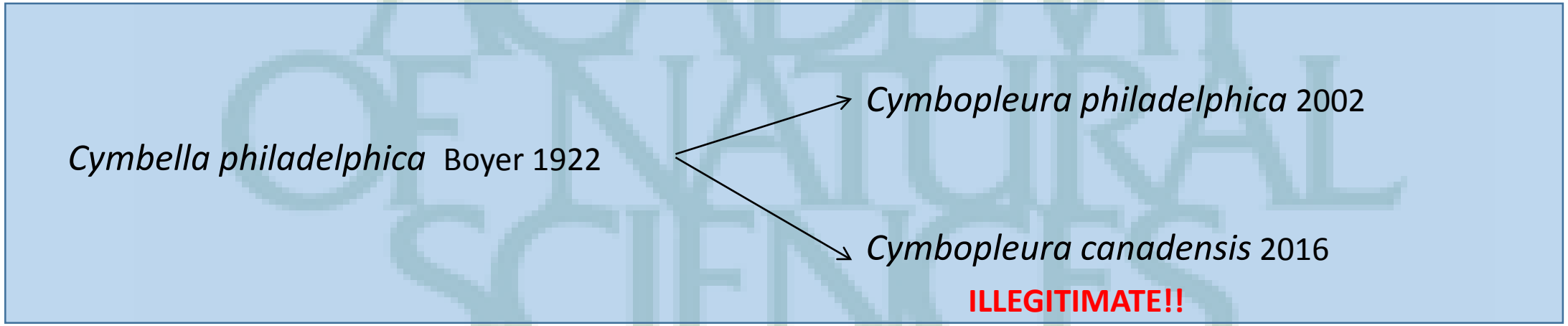
Chelsea smithiae 2005 Vs. *Chelsea smithiae* 2016 → **INVALID!! (A 6, Note 2)**

Type: GC1000a **Type: GC1000a**

ICN rules: Legitimacy

Nomenclaturally superfluous

- 2 different names cannot legitimately be attached to the same type in the same genus (later one = illegitimate) (A 53.1)



ICN rules: Nomenclature

- Mostly fixable errors (does not make taxa invalid if wrong)
  - Epithet endings should agree with the gender of person the taxon is named after (A 60.12, R 60C.1)

- Nomenclatural rules that affect validity
  - Genus name cannot be based on a morphological term (Since 1912) (A 20.2)
  - "*genuinus*", "*typicus*" are invalid epithets (more in the ICN) (A 24.3)

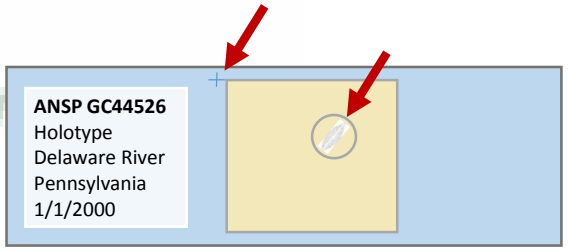
Good practices: ICN Recommendations

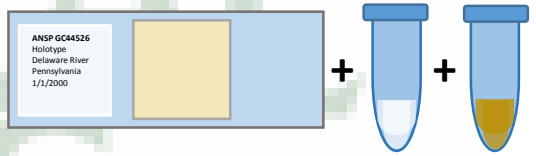
- Type material should be deposited in a **public herbarium** or **collection** (R 7A.1)
- **Image of a type** specimen should be published (for non-fossil diatoms, R 44A.1)
- **Etymology** should be mentioned (R 60H.1)
- **Authors** should **cite themselves** by each nomenclatural novelty rather than leaving it blank or using other expressions (R 46D.1)
- Author should give a **full description in addition to a differential diagnosis** (R 38B.1, 39A.1)
- **Reference to a basionym/replaced synonym** should come **directly after** a new combination/status/name (not just in the list of references, R 41A.1)
- Authors should **not reuse names of invalid taxa** (R 38C.1)

Good practices: Ideal scenario

- **Best practices are not fully covered by ICN rules and recommendations**

- **Collect** and keep **as much information about the sample(s) as possible**
- **Mark the type specimen** on the slide
  - Use a diamond scriber, not a marker!
- **Designate** at least one **isotype** specimen if possible (on a separate slide from the holotype)
  - and deposit this slide (+ material) in a **different collection**
- **Deposit corresponding material** together with the type slide
  - Ideally an untreated+dried material, and cleaned material (2 vials)
- **Deposit** the slides **ONLY** in **public (not personal!) collections** which are being **actively curated**
- **Deposit** types when the **manuscript** goes **through the proofs**
- Include **short and clear diagnosis** (ideally 1-2 sentences)
  - or at least **clearly label** the section (e.g., when included in the Discussion of a paper)
- **Publish** new taxa **in a peer-reviewed journals**





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Diatom New Taxon File

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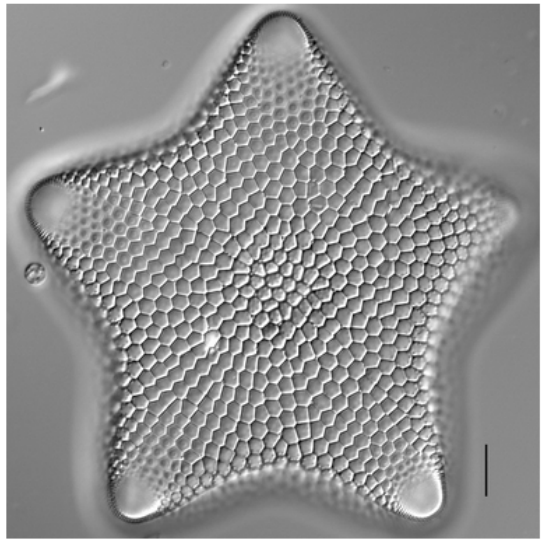

Scanning and uploading completed as of August 17, 2016:
50% (A–*Campylopyxis*, *Nitzschia* c.–Z)

Contact us, please, with any issues, concerns, suggestions and comments regarding this website at ans_diatomherbarium -at- drexel.edu

Diatom New Taxon File at the Academy of Natural Sciences, Philadelphia

This website is meant to serve as a resource for scientists, taxonomists, systematists, students and everyone interested in diatoms and diatom names in particular.

The scanned cards from the Diatom New Taxon File (also known as the "New Species File"), a card catalogue kept and maintained at the Diatom Herbarium at the Academy of Natural Sciences of Drexel University (ANS) in Philadelphia, PA, USA, are presented here in a digital form. In addition, we intend to post here a complete list of diatom names which is being compiled using various resources, such as the names from the California Academy of Sciences "Catalogue of Diatom Names", AlgaeBase, Index Nominum Algarum (INA), and the ANS Diatom Herbarium database. In the long term, we hope to create individual pages for each taxon (which involves, e.g., transcription of all cards), fill in the names published in recent years, and to keep up with the fast growing number of diatom names. We are asking researchers to help by sending us pdfs of their publications of any nomenclatural novelties, such as new diatom names (genera, species, etc.), combinations, statuses, and type designations.

The Diatom New Taxon File of cards was established by Dr. Ruth Patrick with a goal to have a 5 x 8" card for every diatom name published after 1932 when the comprehensive Mill's Index (covering years 1816–1932) was published. Currently, apart from some exceptions, the NSF covers all diatom names, valid, invalid and "problematic" (see tab Details), from 1933 to 2011. Names for years 2012–2014 are completed only partially, and no cards have been made since 2015. From now on, no new physical cards will be created. Instead, an entry in our database will be made and all the information that was usually included on the cards will be uploaded separately to create a searchable taxon page as an alternative to a paper card.

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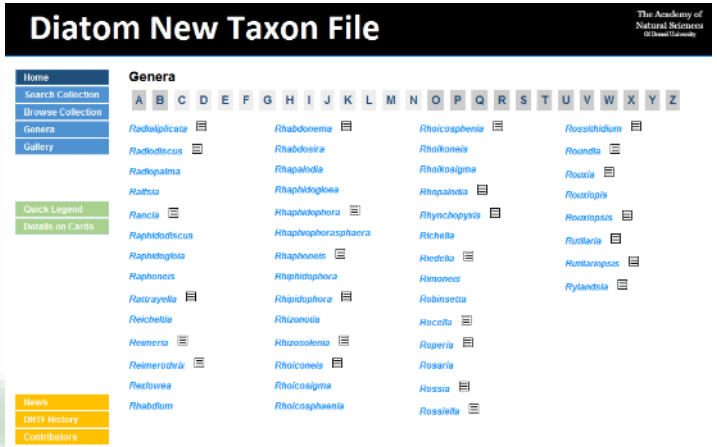

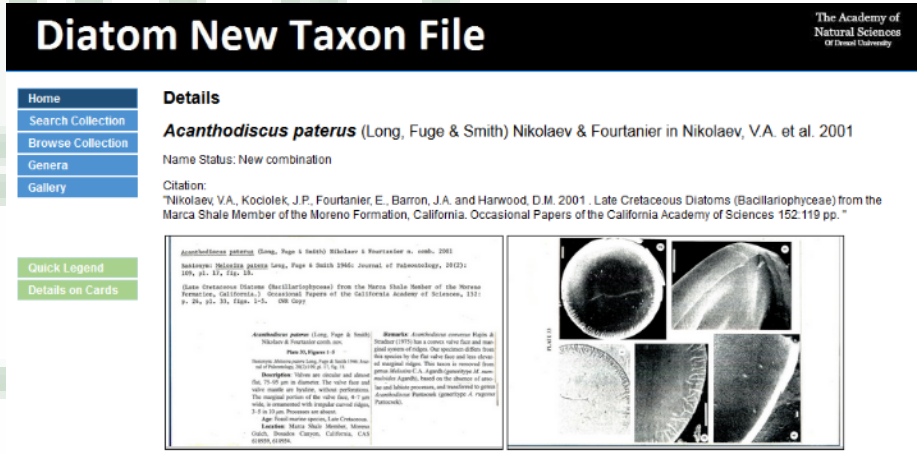

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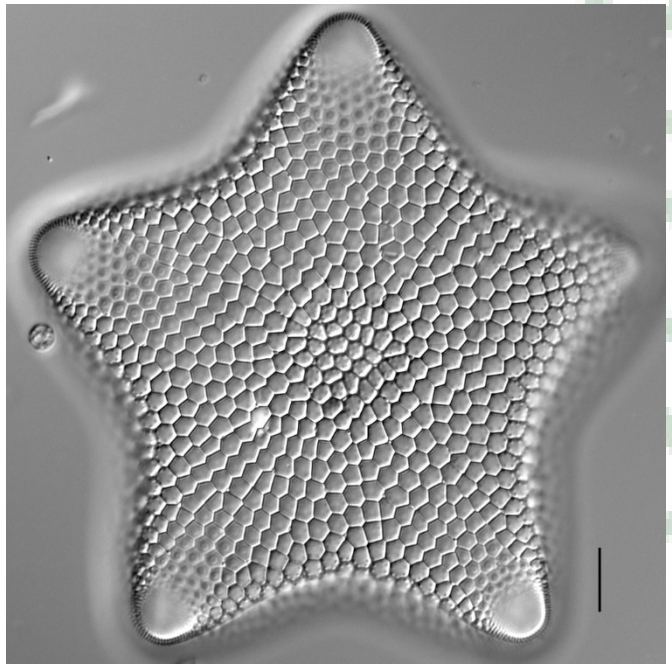

Please, ask us questions!

Do you have any comments/ examples to share?

http://dh.ansp.org/dntf