

ON TYPE NOMENCLATURE

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In this paper no consideration is given to types of genera (Genotypes), as these terms do not apply to actual specimens. Here only those terms are dealt with in which specimens are concerned. It is true that when a new genus with a single original species is described from one specimen this will be not only the type of the species but also a genotype, but even then it is the genotype in an abstract and not in a concrete sense.

The writer has been unable to learn who first described a new species of animal, plant or fossil and after completing his description attached to the specimen a label marked "Type," "Typical Specimen," or some such distinctive word or phrase. But whoever he was, he certainly raised the lid of Pandora's box, beginning the liberation of a list of terms now over one hundred in number and sure to increase further.

To fully appreciate the present situation it seems desirable to present this list here, together with explanatory statements or definitions of the meaning of the different names, and this has kindly been furnished me by Dr. C. P. Alexander, of the Massachusetts State College, as follows. Any reference to this list should, of course, be credited to him.

LIST OF TYPE NAMES PROPOSED THUS FAR¹

TYPE MATERIAL

All specimens that have served as the basis for published primary and supplementary descriptions and figures of organisms.

1. PRIMARY TYPES or Proterotypes.

The original specimens of any described or figured new species.

These include:

Allotype, Chirotype, Cotype, Holotype, Lectotype, Paratype and numerous minor divisions discussed below.

¹The earlier published summaries of type terms given by the late Walther Horn ("Ueber den musealen Missbrauch mit Insekten-Typen," X^e Congrès Internat. d. Zool., sect. 6, pp. 1022-1042, 1929), and by Donald Frizzell ("Terminology of Types," Amer. Midland Naturalist, 14 (6) 637-668, 1933), are incomplete and are published in journals not readily accessible to students of entomology.

2. SUPPLEMENTARY TYPES.

The described or figured specimens used by any authors to supplement or correct knowledge of a *previously defined* species.

These include:

Neotype, Heautotype, Plesiotype and others of lesser value.

3. TYPICAL SPECIMENS (ICOTYPES).

Specimens that *have not* been used in published descriptions or figures, but consist of material which authors have worked on or such as have been collected at the original locality.

The best known of such are:

Homotype, Idiotype, Metatype, and Topotype.

TYPE DESIGNATIONS

1. **Adelfotype**: A topotype obtained by the original collector of the species. Specimens from the type locality and by the original collector (but *not* of the original series).
Dallas, Rev. Chil. Hist. Nat., 31: 212; 1927.
2. **Aedeotype** (Aedoeotypus): The first specimen of a species to have the genitalia studied, together with the genital preparation. See Holoaedeotype, Paraedeotype.
Toxopeus, 3d. Internat. Ent. Kongress, Zurich, 2: 468; 1925 (26).
3. **Allohomoitype**: A homotype (homoeotype) of the same sex as the allo- or lectoallotype.
Betrem, Treubia, 9, Suppl., pp. 3, 246; 1928.
4. **Allolectotype**: An allotype chosen by subsequent designation.
Betrem, l. c., pp. 3, 223, 272, 290; 1928. Same as Lectoallotype.
(Compare also the definition of Allotype.)
5. **Alloparalectotype**: Paratypes belonging to the opposite sex from that described by the original author and chosen subsequently.
Betrem, l. c., p. 3; 1928. (Compare Holotype, Allotype, Holo-paralectotype.)
6. **Alloparatype**: A paratype of the same sex as the allotype.
Betrem, l. c., p. 3; 1928.
7. **Alloplesiotype**: A hypotype (Plesiotype) of the same sex as the allotype.
Betrem, l. c., p. 3; 1928.
8. **Allotopotype**: An allotype from the same locality as the holotype. As intended for use, with the holotype, chiefly to avoid long, cumbersome, locality repetition.
Alexander, Ann. Ent. Soc. Amer., 12: 328; 1919.
9. **Allotype**: An important term that has been variously interpreted by subsequent students.

The following quotation is given to explain the confusion (Alexander, Philippine Journ. Sci., 51: 383; 1933).

"There are two distinct ways in which the *allotype*, or type of the opposite sex from that of the *holotype* or *lectotype* may be selected. It may either be part of the *original series* of specimens and be chosen from such series either by the original author, or by a subsequent author; or, it may be a specimen quite *apart* from the original series, selected at a subsequent date by the original describer of a species or by any later student. Probably far more than one-half of all described insects have been based upon a single or unique type, and according to the first interpretation of the word "allotype," such species could never be represented by a specimen of the opposite sex. In recent years, certain writers have suggested additional type categories to accommodate the second option above listed, that is, the selection of an allotype from material not at hand at the time of the original description of a species. Betrem (l. c. p. 3; 1928) proposed for such a term 'Allolectotype,' not being acquainted with the earlier term 'Lectoallotype' proposed by Curran two years earlier (Can. Ent., 58: 311; 1926). In the opinion of the present writer, both of these latter terms are synonyms of the original definition of Allotype, as proposed by Muttkowski (Bull. Public Museum Milwaukee, 1: 10; 1910). This writer clearly says: 'The allotype need not be described by the protologist (first describer); it can be contained in the original as well as any subsequent description by other authors. Thus if the protolog describes only a holotype male, the first female subsequently described is to be called the allotype.'

"In the light of this clear exposition of what was intended in the original proposal of the term, it would seem that if two distinct terms were required to accommodate the two possibilities above listed it would be necessary to propose a new term for the case where the second sex is described coincidentally with the definition of the holotype."

The following possibilities exist:

1. A specimen of opposite sex to holotype, chosen later, either by the author or by any subsequent student, not necessarily from the original type-series. Muttkowski, 1910.

Synonyms: Allolectotype, Lectoallotype, Neallotype?

2. A paratype specimen of opposite sex to holotype, chosen coincidentally by the original author.

As interpreted by many students, who have proposed the terms listed under 1 for this latter alternative.

A third term Allotype has been proposed:

"A specimen chosen by the original author of a species to show morphologic features not exhibited by the holotype. For example, the holotype of a fossil Brachiopod might be the dorsal valve; the 'Allotype' the ventral valve."

Burling, Journ. Wash. Acad. Sci., 2: 519; 1912.

Howell, Bull. Geol. Soc. Amer., 40: 219; 1929.

On March 3, 1938, in reply to a request for more specific information, Muttkowski substantiated the definition of allotype, as given above. He writes:

“By Allotype I meant to designate a specimen of the opposite sex, regardless of date taken, place taken, or author describing it; it might be a member of the original series and be designated as allotype by the author giving the original name, or be so designated by a later author from the original series; or it might be designated by a later author from a specimen taken at a later date and a different locality. In other words the definition was to be as inclusive as possible, to prevent undue ‘splitting’.” Muttkowski writes that this term was proposed only after much discussion between Professor Brues, Dr. Graenicher, Dr. Peckham and others in the Milwaukee group at that time (1910), primarily interested in taxonomy.

10. **Androtype**: A designated original specimen of the male sex.
Banks and Caudell, *Entomological Code*, p. 15; 1912.
11. **Anirotpe**: (Synonym of Chirotype).
Dallas, *Rev. Chil. Hist. Nat.*, 31: 211; 1927.
12. **Apotype** (as a species): Equals **Hypotype**. Hypotype was considered preoccupied and “apotype” proposed as a substitute. The earlier use of Hypotype was not in Biology and the substitution is not considered necessary.
Schuchert & Buckman, *Ann. Mag. Nat. Hist.*, (7), 16: 103; 1905.
Banks and Caudell, l. c., 15; 1912.
13. **Architype**: A specimen which formed the basis of publication of a species previous to the modern type-interpretation. Unless such a specimen is included in one of the modern categories (in which it will be so termed) it cannot be included with types.
Dallas, l. c., 31: 214; 1927.
14. **Arquetype**: Equals Architype.
W. Horn; *Xe. Congress Intern. Zool.*, sect. 6: p. 1025; 1929.
15. **Associate Type**: Equals Syntype, Cotype.
Schuchert, *Bull. U. S. Nat. Mus.*, 53: 11; 1905.
16. **Autotype** (as a species): A specimen *illustrated* by the author of a species after the date of publication. The term having been earlier used in printing (for a type of printing block) its author changed the name to **Heautotype**. (Schuchert, 1905).
Schuchert & Buckman, l. c., 103; 1905.
This differs from **Plesiotpe (Hypotype)** in that it must be the *author* himself who adds the information.
17. **Basic Types**: Equals Primary Types.
Howell, *Bull. Geol. Soc. Amer.*, 40: 215; 1929.
18. **Chirotype**: A specimen upon which an unpublished name (i. e., a nomen nudum, chironym) is based. Anirotpe, Quirotpe. As soon as a chirotype is properly published, it becomes either a holotype or some other degree of primary type.
Schuchert, l. c., 53: 9, 12; 1905.
Schuchert & Buckman, l. c., 104; 1905.

19. **Chorotype**: A fossil specimen collected from the same stratum as the type, but from a neighboring locality.
Buckman, *Types Ammonites*, 3: 11; 1920.
20. **Clastotype**: A part or fragment of the type specimen of a species.
Proposed for use in Botany.
W. T. Swingle, *Journ. Wash. Acad. Sci.*, 2: 344; 1912.
21. **Clonotype**: A specimen taken from a vegetatively propagated part of the individual plant from which the type specimen was obtained. Used in Botany.
Swingle, *l. c.*, 345; 1912.
22. **Collateral Type**: Any specimen used in the description of a species, with the exception of the primary types.
Schuchert, *Science* (n. s.) 5: 636; 1897.
23. **Cotype** (1, equals *syntype*): Any specimen of the author's original material when no holotype was designated.
Oldfield Thomas, 1893.
Cossmann, *Revue Critique de Paleozoologie*, 74; 1904.
Schuchert, *l. c.*, 53: 11; 1905.
(This is the interpretation commonly used in America.)
(2, equals *paratype*): Any specimen of the original series of type specimens excepting the holotype and allotype.
(Used in this sense especially in England; a synonym of *paratype* as commonly used in America).
24. **Cyrioplesiotype**: The principal or typical specimen among several plesiotypes.
Knight, *Journ. Paleontol.*, 4, suppl. 1: 27; 1930.
25. **Electotype**: Undefined; employed in the case of a species with a poorly preserved holotype, for a specimen from a locality other than the type locality, but which agrees closely with the original description.
Etherington, *Univ. Cal. Publ., Bull. Dept. Geol. Sci.*, 20: 100; 1931.
26. **Ergatotype**: The type of a *worker* in case of polymorphic Hymenoptera. (Carpenter, 1930). This is very close to the meaning of *Morphotype* and is probably an unnecessary term.
27. **Figure-Type**: A term applied to the original figure. (See also *Fototype*).
Schuchert & Buckman, *l. c.*, 15; 1905.
28. **Fototype**: A photograph of a type, rather than a type specimen, and thus usually omitted from nomenclatural consideration.
Dallas, *l. c.*, 31: 213; 1927.
29. **Genotype** (as a species): A *specimen* upon which a genus is based, but not necessarily the holotype of the type-species. This usage conflicts with current practice.
Buckman, *Types Ammonites*, 6: 5; 1926.

30. **Gynetype**: The original specimen of the female sex. A designated type specimen of the female sex of a species. Compare *Androtype* (σ^7).
Banks and Caudell, l. c., 15; 1912.
31. **Heautotype**: Proposed to replace "*Autotype*" which was considered preoccupied. See also Hypotype.
Schuchert & Buckman, *Ann. Mag. Nat. Hist.*, (7), 16: 103; 1905.
Schuchert, l. c., 53: 9, 14; 1905.
32. **Hipotype**: Equals Hypotype (Dallas, 1927).
33. **Holaedotype** (*Holaedoeotypus*): An aedeotype, the preparation being made from the holotype of the species.
Toxopeus, l. c., Bd. 2: 468; 1925.
34. **Holohomoitype**: A homoetype of the same sex as the holo- or lectotype.
Betrem, l. c., 9, suppl. 3; 1928.
35. **Hololectotype**: Equals Lectotype.
Betrem, l. c., 3; 1928.
36. **Holoparalectotype**: Paratypes from the type-series, chosen subsequently to the original definition, belonging to the same sex as the holotype of the species. Contrasts with *Alloparalectotype*.
Betrem, l. c., 3; 1928.
37. **Holoparatype**: Paratypes of the same sex as the holotype. Contrasts with *Alloparatype*.
Betrem, l. c., 3; 1928.
38. **Holoplastotype** (Equals plastotype): Undefined, but inferred from the reference to be the cast of a holotype.
Grabau, *Principles of Stratigraphy*, p. 919; 1913.
39. **Holoplesiotype**: Plesiotype (Hypotype) of the same sex as the holotype. Contrasts with *Alloplesiotype*.
Betrem, l. c., 3, 1928.
40. **Holotype**: 1. The single specimen that serves as type. It may be of either sex and must be selected at the time of first description of the species.
Schuchert, *Science* (n. s.), 5: 637; 1897.
Schuchert, *Bull. U. S. Nat. Mus.*, 53, pt. 1: 9, 10; 1905.
Schuchert & Buckman, *Ann. Mag. Nat. Hist.*; (7), 16: 103; 1905.
2. As a synonym of *paratype*. An unfortunate use of holotype due either to a typographical error or to a complete misunderstanding of the term.
McGinty, *Nautilus*, 46: 65; 1932.
41. **Homoeotype**: A specimen named by *another than the author upon comparison with the type*. Contrasts with *metatype*. The value of a homoeotype is apparent but such value is directly proportional to the standing of the scientist who makes the identification. When made by a leading specialist it takes on a value almost as great as a metatype. The term homoeotype was proposed as a substitute for *Homotype* which is preoccupied

in Biology. (See below). A synonym is Homeotype (Banks and Caudell, 1912).

Walsingham and Durrant, "Merton Rules," London, p. 13, 1896.

Schuchert, Bull. U. S. Nat. Mus. 53, pt. 1: 14; 1905.

Schuchert & Buckman, l. c., 104; 1905.

42. **Homotopotype**: 1. A homotype from the type-locality. Viereck, 1914.
2. A specimen from the type locality determined by later authors. Dallas, l. c., 212; 1927.
43. **Homotype**: 1. That which is constructed on the same plan or type—as metameres of the body. *Not* a nomenclatural term. Century Dictionary, 4: 2871; 1895.
2. Equals Homoeotype; see above.
44. **Hypoplastotype**: An artificial reproduction (model) of a supplementary type. Schuchert, Science, (n. s.), 5: 639; 1897.
45. **Hypotype**: 1. A described or figured specimen, used in publication in extending or correcting the knowledge of a previously defined species. In this sense, replaces "plesiotype," a synonym and homonym. Schuchert, l. c., 637; 1897.
2. Examples which are not quite typical. Schuchert & Buckman, l. c., 103; 1905.
3. Each described or figured specimen of a species. Dallas, l. c., 1927.
46. **Iconotype**: A drawing or photograph of a type. Compare *Fototype*. Dallas, l. c., 213; 1927.
47. **Icoplastotype**: Undefined: from text implies a cast of an Icotype. Grabau, Principles of Stratigraphy, 919; 1913.
48. **Icotype**: A specimen not necessarily used in literature, but nevertheless serving a purpose in identification. As first used by its authors, a general term for "Typical specimens." Schuchert & Buckman, l. c., 104; 1905.
49. **Ideotype**: A specimen examined by the nomenclator (i. e., meta-typical) but not a topotype. Schuchert, l. c., pp. 9, 15; 1905.
Handlirsch, in Schröder, Handbuch der Ent., 3: 89; 1925.
Called also Idiotype (See Schuchert & Buckman, l. c., 104; 1905).
50. **Isocotype**: Equals Adelfotype; see Dallas, l. c., 212; 1927.
51. **Lectoallotype**: A specimen selected from the type series at a subsequent date, of the opposite sex to holotype or lectotype. See Allolectotype. Curran, Can. Ent., 58: 311; 1926.
Lectoallotype was also used by Burling (Journ. Wash. Acad. Sci., 2: 519; 1912) for the meaning of Allotype 3, q. v., no. 9, pt. 3.

52. **Lectoholotype**: Equals Lectotype. (Curran, l. c., 311).
53. **Lectoparatype**: Same as Paralectotype. (Curran, l. c., 311).
54. **Lectotype**: 1. A cotype (syntype) chosen by the author of a species subsequently to the original description, to take the place which in other cases is occupied by a holotype. In this sense it functions exactly as a holotype.
Schuchert & Buckman, l. c., 103; 1905.
2. As above, but the choice of selecting this type is made by subsequent author. This also functions as a holotype.
Handlirsch, l. c., 89; 1925.
- In all senses, lectotype has been termed "the subsequent selection of a holotype" and is always made from a series of cotype or paratype specimens. (See Cotype, 1; No. 23).
55. **Merotype**: A part of an organism that furnished the type specimen of a new species; only applicable in the case of perennial plants or vegetatively propagated lower animals.
Swingle, l. c., 212; 1912.
56. **Metatype**: 1. A specimen received from the original locality (i. e., a topotype; in palaeontology, must be from the exact stratum as well) after the description has been published but determined as belonging to his own species by the original describer himself. Contrasts with Ideotype.
Thomas, Proc. Zool. Soc. London: 242; 1893.
Schuchert, l. c., 9, 14; 1905.
Schuchert & Buckman, l. c., 104; 1905.
2. A specimen subsequently named by the *author* of a species after *comparison* with the *type*.
This meaning is the common one in America and takes no account of the original locality. Contrasts with Homotype.
Walsingham & Durrant, "Merton Rules," l. c., 13; 1896.
57. **Metatopotype**: A metatype from the type locality. See Metatype 1. Contrasts with Homotopotype.
Viereck, 1914.
58. **Monotype** (as a species): The holotype of a species that was described from a single specimen.
Schuchert, l. c., 16; 1905.
59. **Morphotype**: 1. A selected specimen of the second or later form of a dimorphic or polymorphic species. Term originally proposed by Muttkowski, l. c., 1910, (under allotype), and not by Banks & Caudall, Ent. Code; 15; 1912, as commonly cited.
In a letter, March 3, 1938, from Muttkowski, he suggests possible further modifications of the present term. He writes: "A point of the discussions we had on type nomenclature back in the Milwaukee days just now occurs to me. Seasonal dimorphism of males, especially in connection with nuptial colors and structures in birds, salamanders, fish, frogs and toads, reptiles, etc., were discussed. Here Morphotype was held applicable for the dimorphic member of a sex, even if dimorphism

was only seasonal, hence transient and not permanent as in some insects."

2. A figured specimen not adding to knowledge of the species.
Howell, Bull. Geol. Soc. Amer., 40: 219; 1929.

60. **Neallotype**: The type of opposite sex to holotype.
Durrant, Joicey & Talbot, Bull. Hill Mus., 1: 7; 1921.
Compare with Allotype; Allolectotype; Lectoallotype.
61. **Neanotype**: The type of a pupa (in entomology).
Alexander, Cornell Univ. Mem. 38: 743; 1920.
62. **Neocotype**: A new syntype, collected by a subsequent author in the event of loss of the original type material.
(Compare the various definitions of Neotype).
Howell, l. c., 219; 1929.
63. **Neoholotype**: A new holotype selected by a subsequent worker in the event of the loss of the original type material.
(Compare Neotype).
Howell, l. c., 219; 1929.
64. **Neoparatype**: A figured specimen used in addition to the type in re-definition of a species whose original types have been lost.
Plummer Howell, Bull. Geol. Soc. Amer., 43: 266; 1932.
65. **Neosyntype**: A new syntype selected by a later worker in the absence of any original type material.
Howell, l. c., 40: 218; 1929.
Very close to No. 62.
66. **Neotype**: 1. A topotype figured or described to represent a species of which the original specimen (holotype) has been lost or destroyed.
Cossman, Essais de palaeoconchologie comparee, 2: 2; 1896.
Cossman later (1904, l. c.) modified this as follows:
"Neotype for the specimen afterwards taken as the type of a species when the original type (holotype) has disappeared; but it seems indispensable that the new specimen should come from the same locality or same geological horizon."
2. A specimen (not necessarily a topotype) subsequently selected as a type when the holotype is lost or destroyed.
Schuchert, l. c., 13; 1905. Handlirsch, in Schröder, l. c., 1925.
The latter is the meaning commonly accepted by entomologists in America. Some zoologists believe that when the holotype is fragmentary, subsequently discovered material in *a better state of preservation, even when the type is preserved*, should be added to the type-series as Neotypes. Thus, fossil mammals or reptiles originally known from a single tooth or other fragment may later be discovered in almost perfect condition and such specimens would become Neotypes.
67. **Nepionotype**: The type of a larva of a species.
Alexander, l. c., 743; 1920.
68. **Norm**: As commonly used, equals "typical."

69. **Onomatotype:** A specimen cited in print but not adding to our knowledge of the morphology of a species. Compare Morphotype 2, No. 59.
Howell, l. c., 40: 219; 1929.
70. **Ootype:** 1. A genital organ in certain tapeworms. *Not* a nomenclatural term.
Shull, Larue & Ruthven, Principles of Animal Biology, 130; 1920.
2. Theoretically, the type of an egg; preoccupied by the last. (Ovotype, Ovoholotype, Ovoparatype, etc.)
71. **Paraallotype:** Equals Alloparatype.
F. Betrem, l. c., 208; 1928.
(Compare Parallotype, Fernald, No. 74).
72. **Paraedoeotype:** (Paraedoeotypus): Aedeotype where the preparation is made from one of the paratypes.
Toxopeus, l. c., 468; 1925.
73. **Paralectotype:** A paratype selected from the type-series at a date later than that of publication. Compare Lectotype & Allolectotype.
Betrem, l. c., 113; 1928.
74. **Parallotype:** Paratypes of the same series and sex as the Allotype when this was described by other than the original describer of the species. Compare Paraallotype and Alloparatype.
Fernald, Proc. U. S. Nat. Mus., 71, Art. 9, 19; 1927.
75. **Paratopotype:** A paratype from the type-locality and with identical data to the holotype.
The use of this term and of *allotopotype* often saves much repetition when the entire series is from a single locality with detailed data: e. g.; "Bear mountain Creek, Plumas Co., Cal., alt. 9800 feet, Aug. 23, 1930, C. W. Smith."
Alexander, Proc. Acad. Nat. Sci. Phila., 496; 1916.
76. **Paratype:** 1. A specimen belonging to the original series, after the holotype (and allotype) have been selected.
A paratype may be selected subsequently as the holotype of a new species if it proves to be undescribed and non-con-specific with the actual holotype of the species.
Oldfield Thomas, l. c., 1893.
2. In bacteriological usage, a form possessing the sum of the characters of the normal form, but differing in one or more respects. *Not* a nomenclatural term.
77. **Paratype Allotype:** A paratype from a different locality than the holotype. (Equals Paratype).
F. Silvestri, 4th. Internat. Cong. Ent., 693; 1929.
78. **Paratype Omotype:** A paratype from the same locality as the holotype. (Equals paratopotype).
F. Silvestri, l. c., 693; 1929.

79. **Phase Type:** A type specimen exhibiting a phase different from that of a holotype, such as a specimen of another sex, age, dimorphic form, ecologic response, etc.
Waterston, 4th. Internat. Cong. Ent., 696; 1929.
(See Morphotype, etc.).
80. **Photographotype:** Equals Phototype.
Kellerman, Journ. Wash. Acad. Sci., 2: 347; 1912.
81. **Phototype:** A photograph of a type specimen. Compare the later (1927) "Fototype."
Kellerman, l. c., 2: 347; 1912.
82. **Piesmotype:** A picture printed from a plate bearing an imprint made by mechanical means from an authentic merotype (No. 55). Proposed for use in Botany.
Swingle, Science (n. s.) 37: 866; 1913.
83. **Plastocotype:** See Plastoholotype.
Burling, Journ. Wash. Acad. Sci., 2: 519; 1912.
84. **Plastoholotype:** An artificial mold made directly from the holotype of a paleontological specimen.
Burling, l. c., 2: 519; 1912.
85. **Plastoparatype:** See Plastoholotype.
86. **Plastotype:** Any artificial specimen molded directly from a primary type. Models not directly casted are excluded from this category. Used especially in Conchology and Paleontology. Compare also: holoplastotype, hypoplastotype, icoplastotype, protoplastotype and Nos. 83-85, above.
Schuchert, Science (n. s.) 5: 639; 1897.
87. **Plesiotype:** 1. A specimen, *Not a Topotype*, figured or described as an example of an already named species.
Cossman, 1896, l. c., 2: 2; 1896.
Schuchert, l. c., 53: 12; 1905.
Later, Cossman (l. c.; 1904) modified this as follows: "An individual of a described form, whether from the same locality or another, which one compares with a species and for which one gives a *new description* and a *new figure*."
Hypotype and apotype are identical. Contrasts with Heautotype (Autotype, No. 16). In the present case the additional description or figure, or both, need *not* be by the *original describer* of the species. Ex.: Pratt, Revision of genus *Arotes*; supplementary notes and figures, specimens used are Plesiotypes.
2. Plesiotype. A specimen identified by a later author, poorly differentiated from homotype or metatype.
Schuchert & Buckman, Ann. & Mag. Nat. Hist., (7) 16: 103; 1905.
88. **Post Type:** The first proposed term for what is now commonly called "Neotype," later rejected by its author.
Cossman, l. c., 2: 2; 1896.

89. **Primary Type:** A specimen upon which the description of a new species is based, wholly or in part. Equals Basic Types. Proterotypes.
Schuchert, l. c., 5: 637; 1897.
90. **Proterotype:** Equals Primary Types.
Schuchert, Bull. U. S. Nat. Mus., 53: 9; 1905.
91. **Protograph:** 1. Original figure or figures illustrating a holotype. The original description is the Protolog. The original describer is the Protologist.
Schuchert & Buckman, l. c., 1905.
2. The single figure of *some one of the primary types* made by the author at the time of the original description of the species.
Handlirsch, in Schröder, l. c., 3: 89; 1925.
92. **Protoplastotype:** A cast of a Proterotype.
Grabau, Principles of Stratigraphy, 919; 1913.
Frizzell, Am. Midland Nat., 14: 662; 1933.
93. **Prototype:** 1. The most primitive representative of a group; in most cases a fiction or hypothetical type. See Archetype, No. 13.
2. Equals Proterotype or Primary Type.
Handlirsch, l. c., 3: 89; 1925.
94. **Protype:** A specimen which because of its completeness supplants a fragmentary holotype. The proposer recommends that the protype of a species be given a *subspecific* name different from that of the holotype. This latter term does not conform to any recognized systematic procedure.
Troxell, l. c., Journ. Geol., 29: 476; 1921.
95. **Proxy Types:** Equal Prototypes. See No. 94.
Troxell, l. c., 29: 479; 1921.
96. **Quirotype:** Equals Chirotype.
Dallas, l. c., 31: 211; 1927.
97. **Secondary Types:** Equals Supplementary Types. Contrasts with Primary Types.
98. **Supplementary Types:** Specimens used by an author to supplement or correct knowledge of a previously defined species. Includes Flesiotype, Heautotype, Neotype.
Schuchert, l. c., 1897.
99. **Spermotype:** A specimen taken from a representative plant grown from the seed of a type plant. A botanical term.
Swingle, Journ. Wash. Acad. Sci., 2: 345; 1912.
100. **Stratotype:** The type of the soldier caste in ants.
Cole, Can. Ent., 68: 36; 1936 (footnote).
101. **Synthetograph:** A figure made from two or more individuals of the type-series. This composite figure is a synthetograph. Contrasts Protograph (No. 91).
Schuchert, l. c., 1905.

102. **Syntype:** 1. Any specimen of the author's original material when no holotype was designated; or any of a series of specimens described as "cotypes" of equal rank. In this sense equals Cotype as commonly used.
Bather, *Natural Science*, 4: 57; 1894.
2. A specimen other than the holotype of the species upon which the original description is based. Equals Paratype as commonly used.
Lupher & Packard, *Univ. Oregon Publ.*, 1: 204; 1930.
103. **Teratotype:** The type of an abnormality or monstrosity. The term has been criticized because a monstrosity is a chance occurrence and not a taxonomic unit.
Dallas, *l. c.*, 31; 214; 1927.
104. **Tophomeotype** (combination of Topo and Homeo): A specimen from the original locality, identified by an authority. Compare Homotopotype, No. 42, and Metatopotype, No. 57.
Howell, *l. c.*, 41: 199; 1930.
105. **Topotype:** A specimen from the original locality from which a species was described. These are of the very greatest importance, especially if from the exact place (and date), or, in the case of geological specimens, from the identical stratum. Many terms are either synonyms or too close for usage; See Nos. 50, 104. Modifications of this, as Allo.-, Para.-, Homo.-, and Meta.-, are of importance.
Oldfield Thomas, *l. c.*, 1893.
Schuchert, *l. c.*, 53: 9, 13, 14; 1905.
Schuchert & Buckman, *l. c.*, 16: 104; 1905.
106. **Type:** 1. The holotype of a specimen.
2. Any of the original type material.
107. **Type Material:** All original material used in the description of a species, as well as all material used to supplement the description.
Schuchert, *Science*, (n. s.) 5: 637; 1897.
108. **Typical:** Referring to a specimen with characters corresponding to those of the type material. A useful, but scarcely nomenclatural term.
Schuchert, *Bull. U. S. Nat. Mus.*, 53: 9, 14; 1905.

In addition to the above list Alexander gives about a dozen names ending in "type" which are not nomenclatural terms but are used in Genetics or elsewhere. A few, however, are used in both ways and their non-nomenclatural meanings have also been given here to facilitate comparison with their other uses.

It is evident from this list that there are many synonyms contained in it. This may have been due to ignorance on the part of their makers that equivalent terms were already in

existence, or possibly to the fact that there are no rules for nomenclatural terms and therefore one has as much right to be used as another. Some workers, however, have accepted the principle of priority as applicable here (see Nos. 12, 32, etc.) and this is most desirable in order to eliminate the duplicate terms.

With two exceptions (Nos. 61, 67) all these terms relate in some way to the adult except possibly in Palaeontology. But Pandora's box has many more which may escape. At any time some worker may describe the hitherto unknown egg of an insect and mark it as some kind of a type: equally, newly described specimens of naiads in each of their many instars (45 or more in some species), nymphs, larvae and subimagos may become the bearers of different kinds of type names. There is at present no rule to prevent this. This enormous number of naiad, nymph, and larval instars available in so far as none of them have previously been described, needs only a few workers with the "mihi itch" to deluge the nomenclatural field with a flood of type names.

But this is not all. The first describer of the leaf mine of an insect will have a field for a new list of type names for the different types of mines and an opportunity to place on such specimens a colored label! Students of gall insects, too, can doubtless find undescribed plant galls to provide another list of type names.

The present condition of type nomenclature is such that it seems not improbable (certainly not impossible) that entomologists at least may find themselves buried in a chaos of this phase of terminology.

It seems to the writer that the time is ripe for a consideration of this subject by some body of scientists which can establish rules for the nomenclature of types, classifying the terms; determining which are synonyms or duplicates and establishing rules for priority and on such other subjects as may be needed. It might be well, also, to make a classification of the primary and secondary types.

The writer will here venture only one suggestion, viz.: that Primary Types should include only those specimens used in preparing the original descriptions and specimens actually compared with these. Other specimens should have no higher standing than that of Supplementary Types. Possibly a different suffix for the names in this group might be helpful.