

A GLOSSARY OF ENTOMOLOGY

Smith's "An Explanation of Terms Used in
Entomology"

Completely revised and rewritten by

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and

SUPPLEMENT A

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INTRODUCTION.

The broad general purpose of a vocabulary or dictionary of technical terms is solely to reflect usage. Its basic principle is to furnish information to those seeking to know a terminology. It is not for the lexicographer to read meanings into terms nor to redefine them according to preconceived ideas that may have found lodgment in his mind. He, indeed, *must* take the language or the terminology as he finds it; and must refer back to the originator of the term or to the consensus of usage for meanings. Nor is it the function of a word book to set standards; these must be the fruit of coöperative and self-denying effort on the part of many specialists in the science of entomology. All terms, so far as practicable or known, must be included, and defined as used by those expert in the matter or who specialize in any given branch. Hence, it is necessary to include also the special terms and technicisms applicable to restricted groups, not alone the more general terms which may almost be deemed to be elementary and known to all. In the modern extensions of entomology, which touch so many branches of science, almost any student is likely to meet with special terms outside of his own particular field. Thus, Snodgrass originates or redefines many terms; we must interpret these according to his intent.

The entomologist of the early days was the closet naturalist *par excellence*. He was a distinguisher and namer of things not heretofore discriminated. In consequence, an undue value was set on the bare description of species and of the higher categories. The natural result flowed from this: a new technical vocabulary came into being; and since so much of the work done was independent and so much on very limited groups, practically each investigator invented new terms for his group, or improved on those of his predecessors, or by misinterpretation misnamed structures already recognized and named. But this condition naturally made any explanation of terms refer practically to nothing other than those structures employed in entomography or descriptive entomology.

The fundamental definitions of early terminology are to be found in Kirby and Spence. These terms are given herein as defined by them. Many are now obsolete; but many others have become crystallized into definite and fixed meanings and are still in current usage. Moreover, such fundamental definitions are the key to the sense of their predecessors—a key needed by all who attempt definitive work based on the earlier post-Linnaean authors—perhaps even to the last quarter of the XIXth century. Again, workers in the several Orders at times have given definite and distinct meanings to established terms to meet an exacting requirement of taxonomy in a given Order; such meanings, with the Order in which they apply, are set forth and defined accordingly.

Time moves inexorably. Entomology is now definitely past the descriptive stage pure and simple. Today, no entomological vocabulary can dissociate itself from the many aspects of biology in general, which derive from insects; even the physical sciences are embraced in this purview. Accordingly, terms are included in this revision covering not only entomology single and alone, but likewise the sciences into which it enters—embryology, cytology, physiology, morphology, development, genetics, ecology; and also certain terms in chemistry, physics, botany, medicine, etc., to be met in modern general and special treatises on insects—all to be defined in those fields and senses in which they apply to insects as such and as parts of the bios.

The rise of medical entomology has brought in its train a twilight zone of terminology impinging on both medicine and entomology. Acquaintance with certain of these terms is necessary to make easy the understanding of the terse references in texts on insects, as well as the more technical papers, by physicians and other non-entomologists, on the biology of certain insects as carriers of disease. A selection of such is given and the terms defined.

Some—but very few—mathematical terms are also included, for the reason that a certain stream of biological thought (which includes entomology) is endeavoring to express life mathematically; and also, that in certain insect descriptions, particular characters are expressed numerically, mostly as ratios.

In general, terms are in the singular, sometimes in the plural, when the latter is the general usage, but both singular and plural are indicated, especially when there is any question as to the correct form of either. Plurals are given for the root-word, at least. In most of the older terms, which are anglicizings of the Latin, the Latin form is also indicated. There are naturally included many straight Latin terms found in such general works as Imms, Snodgrass, Tillyard, etc. No words in other languages are included, with the few rare exceptions which seem to have crept into standard English usage in the general works.

Many highly specialized usages are doubtless omitted. So many authors are prone to improvise terms for structures or functions in limited groups, that short of a complete revision of *all* the literature for each and every group, it becomes unavoidable to omit them. Many of these improvised terms have died with the author; others have gone out of use because they were new, and perhaps less felicitous, expressions to take the place of terms crystallized by long usage and thoroughly understood by all workers.

As a rule, the terms defined are referable back for usage to the general works mentioned in the Bibliography. The authority for the terms as defined is added in parentheses at the end of the definition, as (Snodgrass). In the case of this author, the terms are taken verbatim or with slight changes from his *Insect Morphology*, by kind permission of the publishers, the McGraw-Hill Book Co., of New York.

The terms as used or invented by MacGillivray in his *External Insect*

Anatomy are included. They are, in general, separately lined from other like terms. They are also defined in *his own terminology*, which may be ascertained by consulting any of the words in its proper alphabetical place in this Glossary. In many cases his terms are straight substitutions for others already in general accepted usage, hence, redundant. The same holds true for the MacGillivray terms in Coccids, certain of which, however, appear to be coming into usage. All these terms bear the indication (MacGillivray).

The purpose in the definitions as given is to fix a strict meaning of a term or word. The general definition is given as well as the several special usages in various groups, and the applications of specific authors. It has been the endeavor to make the definitions as clear as possible, and in consequence, the plates are only to clarify any obscurity. Colors are defined as nearly as may be in words. They are not referred to any standard color-keys or charts, for the reason that few descriptive entomologists are likely to have any of these at their elbows.

The MS and the proofs have had over twenty-five readings: any errors or misprints are the consequence of the imperfect human element.

Appreciation is due to Dr. G. C. Crampton, who kindly furnished a list of terms in morphology, here accredited to him; to Dr. A. B. Klots, who kindly has furnished definitions of some hundred or more elusive terms, and who with Dr. A. G. Richards, Jr., has made the drawings for genitalia and wing-venation in Lepidoptera; to Mrs. Lenore Reese Sias, who has defined many of the chemical terms; and to her and to my dear wife, Mrs. Lillian R. de la Torre-Bueno, for carrying the burden of collating and correcting proof with me; both have helped greatly in the clarification of many obscurities in expression or definition. And finally, my gratitude is without stint to my friend Mr. George P. Engelhardt for his encouragement and understanding in the accomplishment of this work; and to the Brooklyn Entomological Society for their unwavering support in the preparation and publication of this Glossary.

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EXPLANATION OF TERMS

A

a-, prefix; wanting or without.

ab-, off; away from.

abbreviate, *abbreviatus*, disproportionate shortness in a part; cut short; not of usual length.

- fascia, a fascia traversing less than half a wing.

abscissa, in the wing, a more or less segregated or distinct segment or section of a vein; e.g., *abscissa* of radius.

abdomen, the third or posterior division of the insect body; consists normally of nine or ten apparent segments; bears no functional legs in the adult stage.

abdominal, belonging to or pertaining to the abdomen.

— **feet**, see *prolegs*.

— **ganglia**, the ganglia of the ventral nerve cord which innervate the abdomen, variable in number, each giving off a pair of principal nerves to the muscles of the segment (*Imms*); generally one to a segment, lying between the alimentary canal and the large ventral muscles.

— **groove**, the concave lobe of the inner margin of the hind wings enveloping the abdomen beneath in some butterflies.

— **pouch**, in female *Parnassiids*, a sac-like ventral cavity formed by material secreted during copulation.

— **region**, the third of three regions into which the embryonic trunk segments become segregated, the appendages of which are obliterated or reduced (*Snodgrass*).

abduction, drawing back; retraction.

abductor, *abductor* muscle, any muscle that opens out or extends an appendage or draws it away from the body; cf. *adductor*.

— **coxa**, the second of the strong muscles of the coxa, which pull it.

— **mandibulae**, the muscle that opens the mandibles.

aberrant, departing from the regular or normal type.

aberration, a form that departs in some striking way from the normal type, occurring either singly, or rarely, at irregular intervals.

abiogenesis, spontaneous generation.

abnormal, outside the usual range or course; not normal.

aboral, in a direction away from the mouth.

aboriginal, first; original; native.

aborted, developed so as to be unfit for normal function; obsolete or atrophied.

abortion, imperfect or non-development of any normally present part or organ.

abraded, scraped or rubbed.

abrupt, sudden or without gradation.

abscissus, cut off squarely, with a straight margin.

absconditus, hidden; concealed.

absolute, that to which all else is relative, existing in and of itself, independently and actually; a philosophical something not existing in nature.

Acalypterae, see **Acalyptrata** (Imms).

Acalypteratae, the acalypterate muscoideae—those with very small or linear squamae (Curran); **Acalyptrata** of authors.

Acalyptrata, those muscid flies in which alulae are absent or rudimentary; **Acalypteratae** of Curran; **Acalypterae** of Imms.

acanthoparia (pl., **acanthopariae**), in scarabaeoid beetle larvae, the spiny marginal parts of the paria (q.v.), the lateral paired region of the epipharynx (Böving).

acanthus, a spine, spur or prickle.

Acarina, the ticks.

acaudal, **acaudate**, without a tail.

accessory, secondary; or adjoined to any primary structure.

— **appendages**, in Odonata, the genital appendages on the venter of the second abdominal segment (Garman).

— **carinae**, in Orthoptera, the lateral carinae of the face.

— **cell**, a wing cell not commonly present in the group; in some orders of definite location as, e.g., in Lepidoptera, usually a small cell at the end of the subcosta, giving rise directly or indirectly to veins 7 to 10; 1st radius, (Comstock); areole; a small cell occurring in the wings of many Lepidoptera, between R_{2+3} and R_{4+5} , and closed at the end by the sectorial crossvein (Klots).

— **contractile organs**, in insects, sac-like membranous structures which contract independently of the heart, generally in the joints of appendages; e.g., in the legs of Nepidae in the Heteroptera; accessory pulsatory organs.

— **genitalia**, in Odonata, see accessory appendages (Garman).

— **gland**, in general, any secondary gland of a glandular system.

— **lobes**, ventral lobes of the protocerebrum.

— **pulsatory organs**, accessory circulatory organs, q.v.

— **sac**, a glandular structure of the female reproductive system containing a sticky secretion.

— **subcostal vein**, the vein given off from the subcosta and branching toward the apex of the wing in Perlidae.

— **tympanal membrane**, in Lepidoptera, a secondary membrane of the tympanum; morphologically a membranized part of the postnotum (Richards).

— **veins**, secondarily developed longitudinal veins in the wings of insects (Comstock and Kellogg).

acclivous, rising gently.

accommodation, in vision, the ability to change the focus of the eye at will.

acrescent, **acrescente**, increasing gradually in thickness toward the apex.

aceous, **aceus**, suffix; similar to, or of the nature of.

acephalous, without a head.

acerata, arthropods without true antennae; Arachnida and Limulus.

acerous, without antennae.

acetabular caps, in Hemiptera, the coxal cavity.

acetabuliform, like a shallow saucer with more or less incurved sides; of the shape of an acetabulum or coxal cavity.

- acetabulum** (pl., *acetabula*), the cavity into which an appendage is articulated; specifically a coxal cavity, q.v.; also a cup-like cavity in the sucking mouth of maggots.
- acetic acid, glacial**, a clear, colorless liquid, with a pungent characteristic odor resembling vinegar and with an acid taste when well diluted with water; miscible with water, alcohol and glycerine; used in hardening tissues and for other histological purposes.
- achatine, achatinus**, resembling the lines of an agate in more or less concentric circles.
- Achreioptera**, an ordinal term proposed for the coleopterous family *Platypsyllidae*.
- achromatic**, free from color.
- achromatin**, that part of the cell nucleus which does not stain with chromatin.
- acia**, a thin cuticular plate of the mandible (MacGillivray).
- acicula** (pl., *aciculae*), needle; spine.
- acicular**, needle-shaped; with a long, slender point.
- aciculate, aciculatus**, appearing as if superficially scratched with a needle.
- acid**, a chemical compound having a sour taste and turning blue litmus red when in solution, that is, containing the H^+ radical; a salt of hydrogen.
- **alcohol**, 70% alcohol to which is added 0.1% to 1% hydrochloric acid; used for destaining.
- **gland**, in aculeate Hymenoptera, one of a pair of filiform glands opening by a duct into the poison sac, which secretes the acid constituent of the poison (Imms).
- **scent**, a pungent, sour smell.
- acidotheca**, the pupal sheath of the ovipositor.
- acies**, the extreme termination of a margin.
- acinacicate, acinaciform, falcion-shaped**; curved and growing wider toward the bend with a truncate apex.
- acini** (sing., *acinus*), granulations, like those on a blackberry; the terminal secreting tubes of glands.
- acinose, acinous**, superficially set with acini.
- acone eye**, a type of insect compound eye in which the ommatidium has neither a crystalline nor a liquid cone, in place of which there is a group of elongated transparent cells (Imms).
- acoustic nerve**, a nerve which connects the auditory pits or other organs of hearing with special ganglia.
- acidophagus**, preying and feeding on grasshoppers.
- acron**, the prostomium, q.v.; in the arthropodan embryo, the head region anterior to the tritocerebral somite (Snodgrass); the first segment of an ant (Jardine).
- acroparia** (pl., *acropariae*), in scarabaeoid beetle larvae, the anterior part of the paria (q.v.) bearing bristles, usually long (Böving).
- acrosternite**, the narrow marginal flange anterior to the antecosta of a definitive sternal plate that includes the preceding primary intersegmental sclerotization; characteristic of abdominal sterna of insects, but absent on thoracic sterna (Snodgrass).

- acrostical** (Curran), **acrostichal**, q.v.
- acrostichal bristles**, in *Diptera*, two rows of bristles on the middle of the dorsum; specifically, minute peculiar bristles on the dorso-central region of *Dolichopodidae*.
- **hairs**, in *Diptera*, hairs lying between the dorsocentral bristles (Curran).
- **setulae**, very short hairs between the dorsocentral bristles (Curran).
- acrotergal**, of or pertaining to an **acrotergite**.
- acrotergite**, the anterior precostal part of the tergal plate of a secondary segment, usually in the form of a narrow flange, sometimes greatly enlarged but frequently reduced or obliterated (Snodgrass).
- acrotrophic**, in the ovary, having the trophic cells remain in the apical chamber.
- **egg tube**, a type of egg tube in which the trophic cells remain in the apical chamber; **telotrophic type** (Snodgrass).
- **ovariole**, a type in which nutritive cells are present in the apices of the ovarioles (Imms); **acrotrophic egg tube** (Snodgrass).
- acrydian**, a grasshopper; grasshopper-like.
- acuductate**, **acuducted**, **acuductus**, with fine scratches as if made with a needle.
- aculea** (pl., **aculeae**), a fixed hair of the cuticula (Comstock); a minute needle-like spicule on the wings of *Lepidoptera* (Tillyard).
- Aculeata**, in *Hymenoptera*, the stingers, including bees and wasps.
- aculeate**, **aculeatus**, pointed; armed with short sharp points; furnished with prickles; specifically, armed with a sharp sting, as the *Hymenoptera*.
- aculeate-serrate**, armed with numerous short points inclined toward one end, like the teeth of a saw.
- aculei** (Busck), in *Lepidoptera*, **microtrichia**, q.v.
- aculeus** (pl., **aculei**), a prickle; a small sharp point; specifically, an ovipositor, especially when sting-like, as in *Hymenoptera*; in male *Tipulidae* a slender, horny, often curved and pointed piece, projected when the forceps is open.
- acuminate**, **acuminated**, **acuminatus**, tapering to a long point.
- acupunctate**, **acupunctatus**, with fine superficial punctures as if made with a needle.
- acus**, see **aculeus**, an ovipositor.
- acutangulate**, forming, or meeting in an acute angle.
- acute**, pointed; terminating in or forming less than a right angle.
- acutilingual**, with a sharp pointed tongue or mouth structure, as in some bees.
- acutilingues**, bees with a short pointed tongue; see **obtusilingues**.
- adanale**, the fourth axillary sclerite of the wing (Crampton).
- adaptive ocelli**, the grouped simple eyes or ocelli of most larvae (Comstock); **stemmata**, **ocellae**, **ocellalae**, **ocellanae** (MacGillivray).
- addorsal**, close to but not quite on the middle of the dorsum.
- addorsal line**, in caterpillars, a longitudinal line, a little to one side of the dorsal and between it and the subdorsal line.
- adductor**, **adductor muscle**, any muscle that draws an appendage to the body or brings parts into apposition; see **abductor**.

- coxae, the second of the powerful muscles of the coxa.
- mandibulae, the muscle that draws in or closes the mandible.
- adeloceratous, with concealed antennae; see cryptocerata.
- adephagid, of or pertaining to the adephagous Coleoptera; or any one of the adephagous Coleoptera.
- adephagous, belonging to Adephaga; see hydradephagous.
- adermata, certain pupae, in which the wings and other parts of the forming imago show through the pupal skin, after casting off the larval skin.
- adfrontals, adfrontal areas, adfrontal sclerites, in lepidopterous larvae, a pair of narrow oblique plates separating the frons from the median epicranial suture (Imms).
- adiaphanous, adiaphanus, having a surface transparency; opaque, not transmitting light at all (Kirby and Spence).
- adipoleucocyte, a form of haemocyte blood-cell in which the cytoplasm has become charged with small oily fat droplets; an adipose cell found in certain Heteroptera (Wardle).
- adipose tissue, in insects, see fat body.
- adiscota, insects which develop into adults without forming imaginal discs; see discota.
- adminiculum (pl., adminicula), one of the minute teeth on the dorsal abdominal surface in subterranean pupae; the elevated or indented lines to be found in certain pupae; supports or props.
- adnate, adjoining; adhering or growing together; closely connected.
- adoral, to, toward or in the direction of the mouth.
- adpressed, laid or pressed to; contiguous.
- adspers, adspersus, marked with closely crowded small spots.
- adsternal, situated next or close to the sternum.
- adult, the full-grown, sexually mature insect; imago.
- aduncate, aduncatus, aduncus, gradually bent through its whole extent; employed in regard to parts.
- adventitia, the outer layer of elastic connective tissue of the insect heart (Folsom and Wardle).
- adventitious, occurring accidentally, out of the ordinary course, without apparent reason.
- veins, in certain insects, secondary veins which are neither accessory veins nor intercalary veins (Comstock).
- adventral line, in caterpillars, a line which extends along the under side between the middle and the base of the legs.
- tubercle, a tubercle on each of the abdominal segments of caterpillars on the inner base of the leg, and correspondingly set on the apodal segments; constant; number VIII of the abdominal series (Dyar).
- aedeagal apodeme, an apodeme of the aedeagus.
- aedeagus, aedaeagus, in male insects, the penis or intromittent organ, situated below the scaphium and enclosed in a sheath (Imms); the distal part of the phallus, typically a sclerotic tube; often incorrectly termed the penis, a term to be restricted to a muscular intromittent organ found in other groups of animals than insects (Klots).
- aedoeagus, see aedeagus.
- aeneous, aeneus, bright brassy or golden green color.

- aenescent, becoming or appearing brassy.
 aequale, aequata, equal.
 aequilate, aequilatus, of equal breadth throughout.
 aerial, by extension, flying forms of insects, especially of those which also have non-winged or otherwise flightless forms.
 aeriduct, aeriductus, a spiracle; the tracheal, gill-like structures of aquatic larvae; specifically, the tail-like extensions of rat-tailed mag-gots and of some aquatic Heteroptera.
 aerobic, growing or thriving only in the presence of atmospheric air.
 aeroscepsin, a hypothetical sense supposed to be lodged in the insect antennae.
 aeroscepsy, perception of sound or odor through the medium of the air, through the antennae.
 aerostatic, in insects, able to maintain balance in air.
 aerostats, a pair of large air sacs at the base of the abdomen in Diptera.
 aeruginose, aeruginous, aeruginus, the color of verdigris.
 aestival, occurring in summer.
 aestivation, dormance in summer or during periods of continued high temperatures; or during a dry season (Folsom and Wardle).
 aetiology, etiology, q.v.
 afferent, carrying to or inwardly, or toward the center, as a nerve.
 — nerve, a nerve that conducts from the periphery toward a nerve center; the axon of a sensory neurone (Snodgrass).
 — neuron (or neurone), one that conveys inward impulses received or perceived by a sense organ from external sources; a sensory neurone.
 affinis, related to; similar in structure or development.
 afterbody, in Coleoptera, all the body behind the pronotum (Tillyard).
 afternose, a triangular piece below the antennae and above the clypeus; see postclypeus.
 agamic, agamous, reproducing without union with a male.
 agamogenesis, reproduction without fertilization by a male; see parthenogenesis, gamogenesis.
 agglomerate, heaped or massed together.
 agglutinate, stuck or glued together; welded into one mass.
 aggregated, crowded together as closely as possible.
 aggressive mimicry, mimicry of one species by another hostile to it.
 agnathous, without jaws; specifically those Neuropteroids in which the mouth structures are obsolescent.
 aheneus, bright brassy or golden-green.
 aileron, the scale covering the base of forewings in some insects; see tegulae; in Diptera, alula and squama, q.v.
 air-sacs or vesicles, pouch-like expansions of tracheal tubes in winged insects, varying in number, position and size, without taenidia, capable of inflation and supposed to lessen specific gravity, and to aid in flight.
 air-tube, a respiratory siphon.
 ala (pl., alae), the distal expanse of the wings containing veins; a wing or any wing-like structure.
 alacardo, the distal sclerite of the cardo, along the lateral margin of the subcardo; eucardo (MacGillivray).
 alacercus, the caudal filament, telofilum; the median cercus when three cerci are present (MacGillivray).

- alacoxasuture**, the suture between the coxa genuina and the meron in the insect leg (MacGillivray).
- alaforamen**, the opening in the foramen through which passes the alimentary canal (MacGillivray).
- alar**, **alary**, relating to the wings.
- **appendage**, see **alulet**.
- **frenum**, in **Diptera**, a small ligament dividing the supra-alar cavity into an anterior and a posterior part (Comstock); in **Hymenoptera**, a small ligament crossing the supra-alar groove toward the root of the wing (Smith).
- alaria**, the more or less distinct projections of the margin of the notum against which the wing articulates; the notal wing processes (MacGillivray).
- alaraliae** (pl. only), the **prealaraliae** and **postalaraliae** collectively (MacGillivray).
- alarima**, the fissure between the two **paraglossae** (MacGillivray).
- alary muscles**, the dorsal transverse muscles of the body, attached medially on the heart, usually arranged in fan-shaped groups of fibers; wing muscles of the heart (Snodgrass); the paired muscles which actuate and support the insect heart (Imms).
- **polymorphism**, two or more forms of wings in the same species, correlated with sex or not.
- alatae**, the winged forms of the **Aphidae**.
- alate**, having lateral winglike expansions, as in the tibiae of certain insects; or in certain insect eggs.
- alate**, winged; in termites, the winged female; in other insects, any winged form when the apterous also occurs.
- alatus**, winged.
- alavertex**, the part of the vertex on its ventral aspect; the occiput of systematists (MacGillivray).
- albi**, **albus**, pure white; the color of chalk (Kirby and Spence).
- albicans**, formed or made of white.
- albidus**, white with a dusky tinge.
- albinism**, absence of color, or whitening, in a form usually colored.
- albinistic**, tending to whiteness or fading to white in normally dark forms.
- albino**, a colorless individual in a species that is normally colored.
- albumen**, the white of egg or the substances in the tissues which have the same characteristics.
- albumin**, the characteristic substance forming the white of egg.
- albuminoid**, like or of the character of albumin.
- alcohol**, ethyl, C_2H_5OH ; grain alcohol; a product of fermentation of sugars; a clear white liquid readily miscible with water in any proportion; used in hardening and preserving animal tissues and to remove water from them for microscopic preparations.
- **methyl**, wood alcohol; wood spirits; produced by the destructive distillation of wood; a colorless, more or less ill-smelling liquid when impure, used as a substitute for ethyl alcohol in a limited way; metol.
- aleuritic acid**, one of the organic acids contained in lac.
- aleyrodiiform**, resembling **Aleyrodes** in form or shape.

- aliphagous**, algae-eating.
- alienicola** (pl., *alienicolae*), in Aphides, the parthenogenetic viviparous females developing for the most part on the secondary host, often differing markedly from the fundatrices and migrantes (Imms).
- alifer**, the pleural fulcrum of the wing (Crampton).
- alifera** (pl., *aliferae*), the projections of the pleuron against which the pteralia articulates (MacGillivray).
- alimentary canal**, the food tube traversing the body from the mouth to the anus; in insects consisting of an endodermal mesenteron, an ectodermal stomodaeum, and an ectodermal proctodaeum.
- **water**, water taken in with food, or as food.
- alimentation**, feeding or taking in nourishment.
- alinetum**, the wing-bearing plate of the dorsum of the mesothorax or metathorax of winged insects.
- alitrunk**, that part of the thorax to which the wings are attached; in many Hymenoptera it includes the first abdominal segment.
- alizarine**, a transparent orange red.
- alkaline**, having a basic reaction, that is containing the OH^- radical and turning red litmus blue when in solution.
- **alcohol**, 70% alcohol to which is added a few drops of 0.1% solution of bicarbonate of soda (NaHCO_3).
- **gland**, in aculeate Hymenoptera, an unpaired gland discharging into the sting an alkaline secretion which reacts with the acid to make the poison (Imms).
- Alleghanian faunal area**, the part of the transition zone comprising the greater part of New England, southeastern Ontario, New York, Pennsylvania, Michigan, Wisconsin, Minnesota, eastern N. Dakota, northeastern S. Dakota, and the Alleghanies from Pennsylvania to Georgia.
- allelomorph**, a pure unit character in Mendelian hybrids; a member of a Mendelian pair.
- alliaceous**, smelling like garlic.
- alligate**, *alligatus*, fastened or suspended by a thread, like the chrysalis of Papilio.
- alligenesis**, a form of development which includes an alternation of generations (q.v.), as in Cynipids.
- allotype**, a paratype of the opposite sex to the holotype (Banks and Caudell).
- alluring coloration**, in predators, those patterns or colors which attract other species of insects; a form of aggressive mimicry.
- **glands**, glandular structures diffusing an odor supposed to be attractive to the opposite sex.
- allux**, the next to the last joint of the tarsus, in Rhynchophora.
- alpha-chlorophyll**, a form of chlorophyll which produces colors in insects (Wardle); see beta-chlorophyll.
- alpha-female**, α -female, in ants, the normal female when it coexists with the aberrant β -female (Imms).
- Alpine Zone**, Arctic Zone, q.v.
- altaceratubae**, in certain coccids, the ceratubae in the form of large broad cylinders, with usually oblique mouths, located at or near the margin of the pygidium (MacGillivray).

alternation of generations, a manner of reproduction, in which a species that occurs in both sexes periodically produces only parthenogenetic females which in turn, produce the sexual forms; it occurs in Cynipidae and some Homoptera; see heterogeny (Smith); in general, sexual and agamic generations following each other alternately, cyclically and regularly in Hymenoptera and Homoptera.

altus, high; raised above the usual level.

alula (pl., *alulae*), in certain families of Diptera and Coleoptera, the expanded axillary membrane of the wing; in Diptera, *alulet*, *squama*, *calypter* (Comstock): in Diptera a pair of membranous scales above the halteres; *calyptra*, *squamula*, *lobulus*, *axillary lobe*, *aileron*, *scale*, *tegula*, all of which see for usage (Smith).

alulet, in Diptera, the lobe at the basal posterior part of wing; *alar appendage*; *posterior lobe*; has been used the same as *alula*.

alutaceous, *alutaceus*, rather pale leather brown; covered with minute cracks, like the human skin.

alveolate, *alveolatus*, furnished with cells or *alveoli*; deeply pitted.

alveolation, formation of cells or *alveoli*; or condition of having cells or *alveoli*, q.v.

alveole, *alveolus* (pl., *alveoli*), a cell, like that of a honeycomb; a cup-like cavity or depression in the body-wall, externally, from which rises a structure, specifically, a *seta*; a hair socket.

am-, *amb-*, Latin prefix; round about.

Amazons, obligatory slave-maker ants of the genus *Polyergus*.

amber, the fossilized resin of coniferous trees; a transparent, clear, pale yellowish brown color.

ambient vein, a vein partially encircling the wing close to the margin (Tillyard); the vein-like structure stiffening the margin of the wing (Comstock).

ambipharynx, the membrane along the mesal margin of the proximal end of each mandible, forming the lateral aspect of the prepharynx (MacGillivray).

ambrosia, bee-bread; the food cultures of certain scolytid beetles.

ambulacra, the walking legs of insects.

ambulate, to move backward and forward; to walk, in general.

ambulatoria, the Orthoptera in which the legs are fitted for walking only; e.g., *Phasmids*.

ambulatorial, *ambulatory*, fitted for walking or making progress on the surface.

— *setae*, specialized hairs or bristles, situated on the ventral segments of the abdomen of some Coleoptera.

Ametabola, those insects which develop without a metamorphosis; specifically, the *Thysanura* and *Collembola*, in which it is a primitive condition and the adult closely resembles the young stages.

ametabolic, *ametabolous*, in insectan development, without a metamorphosis.

ametabolion, an insect which has no distinct metamorphosis.

ametaboly, the condition of being *ametabolous*, q.v.

amethystine, *amethystinus*, bright blue with a reddish admixture; clear like an *amethyst*.

- amino acid**, a nitrogen-containing element of proteins, arising from decomposing them by digestive enzymes, acids and alkalis.
- amitosis**, cell division by cleavage without change in the structure of the nucleus.
- amitotic**, not mitotic or without mitosis.
- ammochaetae**, in desert ants, specialized hairs, greatly elongated and directed forward on the lower surface of the head (gular ammochaetae) or in a tuft on the lower lip (mental ammochaetae) used in removing dust and sand from the strigils on the fore legs (Wheeler).
- ammonia**, a gaseous compound of nitrogen and hydrogen.
- ammonium carbonate**, an unstable salt of ammonia and carbon which decomposes readily, liberating ammonia.
- ammonophilous**, sand-frequenting or sand-loving.
- amnion**, the inner envelope covering the germ band and ultimately the entire embryo in the development of the ovum.
- **cavity**, see amniotic cavity.
- **fold**, the extensions of the amnion which close the mouth of the amnion cavity in the embryo (Smith).
- amnios**, the first cast skin of the larva when a moult occurs almost immediately after emergence from the egg.
- amniotic**, of or pertaining to the amnion.
- **cavity**, in the developing egg, a space or cavity formed by the amniotic folds, which contains the germ band (Imms).
- **folds**, folds arising from the edge of the germ band in the ovum, which usually meet (Imms).
- **pore**, a permanent opening in the amniotic cavity in the development of certain insects (Imms).
- amoebiform**, having the appearance or properties of an amoeba.
- amoebocyte**, a form of leucocyte or white blood cell; a nucleated white blood corpuscle or cell of varying shapes, which has amoeba-like characteristics when active.
- amoeboid**, amoeba-like in form or movements.
- amorpha**, those insects in which the pupa bears no resemblance to the imago.
- amphibiotica**, pseudoneuropterous insects with aquatic larvae and aerial imagos; stone-flies; May-flies; dragon-flies.
- amphimixis**, the mingling of the germ plasm of two individuals.
- amphiodont**, a form of male lucanid with mandibles of medium size, between the teleodont and the priodont; mesodont.
- amphipneustic respiration**, a type in larvae in which only the first (thoracic) and the last or two last (abdominal) pairs of spiracles are open.
- ample**, broad; large; sufficient in size.
- amplected**, having the head set into a concavity of the prothorax; e.g., Hister.
- amplexiform**, amplexiform coupling, a term applied to a type of wing-locking mechanism in Lepidoptera in which there is no frenulum and the large humeral lobe of the hind wing projects under the forewing (Wardle).
- ampliate**, **ampliatum**, moderately dilated.
- amplificate**, **amplificatus**, dilated; enlarged.

amplixicate, amplixicatus, dilatate, q.v.

ampulla, a blister or blister-like structure of the surface; in Orthoptera, an extensile sac between the head and the prothorax used by the young in escaping from the oötheca, and later, in molting; Heteroptera, a blister-like enlargement at the middle of the anterior margin of the prothorax; in the genitalia of male Lepidoptera, a process, often finger-like, arising from the inner face of the harpé, near the base, and extending more or less dorsad; see transtilla (Klots).

ampullaceous, ampulla-like, flask-shaped.

— sensilla, see sensillum ampullaceum.

ampulliform, resembling an ampulla, q.v.

amygdaliform, almond-shaped.

amylase, a digestive enzyme which converts starch into maltose or malt sugar; a constituent of saliva.

amylolytic, of or pertaining to the enzyme amylase; having the action or effect of amylase, which aids in digesting starch.

an-, ana-, Greek prefix; up, all through; back; again.

anabolic, relating to the constructive change from food material to animal tissue; see katabolic.

anabolism, the building up metabolic processes; those reactions of the animal body which produce proteins, fats and carbohydrates from food materials.

anacerores, in coccids, cerores located in the rectum; also known as rectal wax pores, rectal spinnerets or honey dew glands (MacGillivray).

anaërobic, able to live without air containing adequate oxygen.

anal, in the direction of, pertaining or attached to the anus or to the last segment of the abdomen.

— angle, on the hind wing, the angle nearest the end of the abdomen when the wings are expanded; the angle between the inner and outer margins of any wing; hind angle of the forewings.

— appendages, in Odonata, movable appendages at the end of the abdomen (Garman); the external genital parts (Smith).

— area, the hinder or anal part of a wing supported by the anal veins; axillary area.

— cells, the spaces between the anal veins (Comstock): in Diptera, anal cell (Williston), the space nearest the body, inclosed by the 5th and 6th veins; sometimes called the third basal cell (Coquillett); 1st anal (Comstock).

— cerari, in coccids, the eighteenth (or last) pair on the anal lobes (MacGillivray).

— cleft, a deep incision found in the females of lecaniine scales extending from the anal orifice.

— crossvein, in Diptera, the crossvein closing the anal cell apically—Cu₂ of Comstock-Needham (Curran).

— disc, in simuliid larvae, the sucker-like point of attachment at the end of the abdomen.

— fan, a fan-like extension of the anal area of the hind wing in insects (Tillyard).

— field, in Orthoptera, the area on the tegmina corresponding to the anal area of the hind wings.

- filaments, see caudal setae.
- fimbria, in Hymenoptera, fringes about the anus.
- fold, see plica vannalis (Snodgrass).
- foot, the tip of the body in larval chironomids, which is modified to serve as a hold-fast.
- forceps, in some Coleoptera, a strongly chitinated structure of the genitalia which projects from the abdomen (Tillyard).
- fork, the cerci of Coleopterous larvae.
- furrow, vannal fold; see plica vannalis; the suture-like groove in the membrane of the wing, usually in the cubito-anal folds; in Heteroptera, in front of the cubitus (Comstock).
- glands, ectodermal glands of the alimentary canal, opening into it near the posterior extremity or the anus, secreting either a lubricant, a silk-gum, or some other specialized material.
- horns, in Collembola, small processes on the last abdominal segment.
- legs, the appendages (or legs) of the tenth abdominal segment in caterpillars.
- lobe, in the wings of Hymenoptera, the posterior lobe of the wings (Comstock); in Diptera, the basal part of the wing behind the anal vein (Curran).
- lobes, in coccids (Lecaniinae), a pair of small, triangular, hinged processes forming a valve which covers the anal orifice.
- loop, in the wings of Odonata, the area including a few or many cells between the branches of the anal vein, or between cubitus and first anal vein (Garman).
- membrane, in the wings of Odonata, a semi-opaque membrane in the hindwing of some dragonflies beginning at the articulation of the wing and extending along the hind margin; the membranule (Garman).
- nervure, the nerve of the wing separating the cubitus from the anal area (Jardine).
- opening, anal orifice; anus; the posterior opening of the alimentary canal (Tillyard).
- operculum, the dorsal arch of the tenth abdominal segment; in caterpillars, supra-anal plate, q.v.
- organs, in Collembola, the two modified hairs arising from a tubercle ventro-cephalad of the anus and usually curving caudodorsad.
- orifice, see anus.
- papillae, in anopheline larvae, four soft white protuberances on the ninth abdominal segment; in Collembola, see anal tubercle.
- plate, in caterpillars, the shield-like covering of the dorsum of the last segment; in the embryonic larva, the eleventh tergite; in Lecaniinae, a pair of triangular or semicircular plates at the cephalic end of the caudal cleft (Comstock); operculum (MacGillivray); valves of the operculum (Green).
- ring, in coccids, an elevated ring-like structure surrounding the anus (MacGillivray); the genital ring; genito-anal ring.
- ring hairs, — ring setae, — ring spines, in coccids, long stout setae of the anal ring, of varying numbers (Comstock).
- scale, one of the lateral processes of the ovipositor in Cynipidae, lying outside and below the lateral scale (Smith).