

A Mosquito Taxonomic Glossary
XV. The Egg*

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For a full explanation of this project see Part I (Knight 1970). As before, terms recommended for standardized use are given fully capitalized; synonyms, terms used in error, and/or unnecessary names are in lower case and underlined; standardized abbreviations are suggested; and an appendix presenting supplementary information is included. Also, terms used in languages other than English are listed under their English counterpart followed by the foreign term in parentheses and references to figures are given for illustrated structures.

Readers are reminded that this is a preliminary presentation and that when all parts are completed they will be thoroughly revised and issued in booklength form. Because of this, individuals interested in mosquito systematics and morphology are encouraged to comment fully on any portion of the included text with which they take exception. If the reader is aware of an earlier use of a particular term, we would appreciate hearing about it.

Part XIV of this series dealt with the larval body excluding chaetotaxy (Harbach and Knight 1978).

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accessory bodies. -- See OUTER CHORIONIC TUBERCLE.

accessory masses. -- See OUTER CHORIONIC TUBERCLE.

air bladders (Schwimmblasen). -- See FLOAT.

air bubbles (camaras aéreas). -- See OUTER CHORIONIC TUBERCLE.

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- air-cells. -- See FLOAT RIDGE and OUTER CHORIONIC TUBERCLE.
- air cells. -- See FLOAT, FLOAT RIDGE and OUTER CHORIONIC TUBERCLE.
- air cell pattern. -- See OUTER CHORIONIC SCULPTURE.
- air-chambers. -- See FLOAT RIDGE and OUTER CHORIONIC TUBERCLE.
- air chambers. -- See FLOAT RIDGE and OUTER CHORIONIC TUBERCLE.
- air channel reticulum. -- See OUTER CHORIONIC RETICULUM.
- air-channels. -- See OUTER CHORIONIC RETICULUM.
- air channels. -- See OUTER CHORIONIC RETICULUM.
- air channels (Luftrinnen). -- See cell boundaries.
- air-floats. -- See FLOAT.
- air floats. -- See FLOAT.
- air-pockets. -- See FLOAT and FRILL.
- air veins (Luftadern). -- See cell boundaries.
- annular ridge. -- See MICROPYLAR COLLAR.
- anterior bosses. -- See LOBED TUBERCLE.
- anterior cap. -- See EGG CAP and COROLLA.
- anterior collar. -- See FRILL.
- anterior cup. -- See COROLLA.
- anterior demarcated area. -- See DECK.
- anterior egg pole (vorderen Eipole). -- See ANTERIOR END under ORIENTATION.
- anterior polar specialised area. -- In the *Culex* egg (Christophers 1945, 25), that part of the outer chorion surrounding the micropyle, actually surrounding the base of the corolla, which appears to be highly ornamented because of the presence of numerous geometrically-arranged outer chorionic tubercles. This area of the outer chorion is not so highly differentiated in most genera. (Syn.: anterior polar surface, Christophers 1945, 33; anterior specialized area, Newkirk 1944, 62.)
- anterior polar surface. -- See anterior polar specialised area.

- anterior pole (vordern Pole). -- See ANTERIOR END under ORIENTATION.
- anterior specialized area. -- See anterior polar specialised area.
- anterior surface. -- See DECK.
- anterior tip. -- See ANTERIOR END under ORIENTATION.
- apical cap. -- See EGG CAP.
- apical collar. -- See MICROPYLAR COLLAR.
- apical corolla. -- See COROLLA.
- apical cup. -- COROLLA and micropylar apparatus.
- apical disc. -- See MICROPYLAR DISC.
- apical end. -- See ANTERIOR END under ORIENTATION.
- apical frill. -- See COROLLA.
- apical horns. -- See HORN.
- apical papillae. -- See OUTER CHORIONIC TUBERCLE.
- apical (posterior) end. -- See POSTERIOR END under ORIENTATION.
- apical process. -- In *Mansonia* species (Mattingly 1972a, 46), the slender anterior portion of the egg giving it a flasklike appearance. (Syn.: neck, Dyar and Knab 1916, 62.)
- appendage. -- See COROLLA.
- attached edge of membrane. -- See FRILL.
- back. -- See DORSAL SURFACE under ORIENTATION.
- batch. -- See EGG BATCH.
- beads. -- See cell boundaries.
- blebs. -- See OUTER CHORIONIC TUBERCLE.
- bladders (Blasen). -- See OUTER CHORIONIC TUBERCLE.
- blunt pole (polo rombo). -- See ANTERIOR END under ORIENTATION.
- boat (batéau). -- See EGG RAFT.
- 'bosses'. -- See LOBED TUBERCLE.

bosses (Buckeln). -- See OUTER CHORIONIC TUBERCLE.

breadth. -- See EGG WIDTH.

callosities. -- See OUTER CHORIONIC TUBERCLE.

canal. -- See micropylar funnel.

cap. -- See EGG CAP.

capsule. -- See OUTER CHORION.

carinae. -- See cell boundaries.

cell boundaries. -- First used by Myers (1967, 797) to designate those parts of the inner chorionic reticulum which enclose a cell, but we include here those terms which have been applied to similar parts of the outer chorionic reticulum. (Syn. for parts of the inner chorionic reticulum: walls, Horsfall *et al.* 1952, 622; ridges, Horsfall and Craig 1956, 370; cell walls, Myers 1967, 797; chorionic cell walls, Brust 1974, 466; polygonal cell margin, Olson and Meola 1976, 98; cell margin, Olson and Meola 1976, 98; carinae, Olson and Meola 1976, 99; polygonal margin, Olson and Meola 1976, 99. Syn. for parts of the outer chorionic reticulum: beads, Herms and Frost 1932, 241; air veins (Luftadern), de Buck 1938, 679; channels (Rinnen), de Buck 1938, 679; air channels (Luftrinnen), de Buck 1938, 682; raised bosses, Gillies 1955, 159; ridges, Hinton and Service 1969, 410.)

cell margin. -- See cell boundaries.

cells. -- See FLOAT RIDGE and OUTER CHORIONIC CELL.

cellular reticulation. -- See INNER CHORIONIC RETICULUM.

CELLULE (Ce) (Fig. 83c). -- In some culicine eggs (Kalpage and Brust 1968, 700), a tiny impressed or elevated subdivision of an inner chorionic cell bounded by minute ridges or shallow grooves, the cellule wall. (Syn.: tubercles, Myers 1967, 796; plaques, Horsfall and Vorhees 1972, 124; papules, Olson and Meola, 1976, 99.)

CELLULE WALL (CeW) (Fig. 83c). -- In some culicine eggs (Kalpage and Brust 1968, 701), a tiny ridge or shallow groove completely or incompletely enclosing a cellule of an inner chorionic cell.

cell walls. -- See cell boundaries.

center portion. -- See INNER CHORIONIC CELL.

central area. -- See INNER CHORIONIC CELL.

central cup. -- See COROLLA.

cephalic end. -- See ANTERIOR END under ORIENTATION.

chambers. -- See FLOAT RIDGE.

channels (Rinnen). -- See cell boundaries.

chorion. -- See OUTER CHORION.

CHORION (C). -- In insects, the outer covering or shell of the egg secreted by the follicular epithelium and consisting of one or more layers; in culicid eggs, usually consisting of only two layers, the inner and outer chorions, but a delicate middle layer occurs in *Aedes aegypti* and perhaps others. (Syn. used for mosquito eggs: egg membranes (Eihäute), Leuckart 1855, 135; shell, Hurst 1890, 50; egg-capsule, Nuttall and Shipley 1901, 50; eggshell, Theobald 1901, 19; egg shell, Banks 1908, 235; egg-shell, Banks 1908, 251; covering, Harwood and Horsfall, 1957, 555.). See appendix.

chorion (Chorion). -- See INNER CHORION.

chorion processes. -- See OUTER CHORIONIC TUBERCLE.

chorion sculpturing. -- See INNER CHORIONIC SCULPTURE.

chorionic bodies. -- See OUTER CHORIONIC TUBERCLE.

chorionic "cap". -- See outer chorionic cap.

chorionic cell walls. -- See cell boundaries.

chorionic envelope. -- See INNER CHORION.

chorionic markings. -- See INNER CHORIONIC SCULPTURE.

chorionic ornamentation. -- See OUTER CHORIONIC SCULPTURE.

chorionic pad. -- Defined by Christophers (1960, 133) as a "gelatinous" swelling of the lower surface "epichorion" when the eggs of *Aedes aegypti* are in water, probably corresponds to the distortion of the surface film around the floating egg.

chorionic pattern. -- See INNER CHORIONIC SCULPTURE.

chorionic pillars. -- See OUTER CHORIONIC TUBERCLE.

chorionic reticulation. -- See INNER CHORIONIC RETICULUM and OUTER CHORIONIC RETICULUM.

chorionic reticulum. -- See OUTER CHORIONIC RETICULUM.

chorionic sculpture. -- See INNER CHORIONIC SCULPTURE.

chorionic sculpturing. -- See INNER CHORIONIC SCULPTURE and OUTER CHORIONIC SCULPTURE.

circular spots. -- See LOBED TUBERCLE.

circular structures. -- See LOBED TUBERCLE.

circular warts. -- See OUTER CHORIONIC TUBERCLE.

clasping membrane. -- See FLOAT and FRILL.

cluster. -- See EGG RAFT.

clutch. -- See EGG RAFT.

collar. -- See COROLLA and FRILL.

collumella. -- See DECK TUBERCLE.

collumellae. -- See OUTER CHORIONIC TUBERCLE.

conical projections. -- See OUTER CHORIONIC TUBERCLE.

conical spines. -- See OUTER CHORIONIC TUBERCLE.

convex surface. -- See DORSAL SURFACE under ORIENTATION.

compartments. -- See FLOAT RIDGE.

COROLLA (Co) (Figs. 84b,c; 86d). -- In many culicid eggs, notably those of the genera *Culex* (Marshall 1938, 36), *Toxorhynchites*, (Mattingly 1969a, 13), and *Culiseta* (Mattingly 1973, 222), a delicate frill-like collar surrounding the micropyle; often readily detachable and frequently lost; associated with a micropylar collar in some *Culex* eggs (Mattingly 1975); probably homologous with the anopheline frill (Mattingly, pers. corres.). (Syn.: neck (col), de Réaumur 1738, 616; cylindrical knob, Kirby and Spence 1826, 93; summit, Kirby and Spence 1826, 731; appendage, Miall 1895, 112; micropilar apparatus, Stephens and Christophers 1903, 69; fringe, Banks 1908, 251; flotation funnel (Schwimmtrichter), Bresslau 1920, 338; striated collar, Nath 1924, 152; collar, Nath 1924, 158; micropilar cup, Christophers 1945, 25; cup, Christophers 1945, 25; frill, Christophers 1945, 32; rim, Christophers 1945, 32; micropylar apparatus, Harwood and Horsfall 1957, 558; central cup, Muspratt 1951, 363; micropyle cup, Clements 1963, in Fig. 16d, 26; anterior cap, Lincoln 1965, 10; egg cap, Lincoln 1965, 11; anterior cup, Hinton 1968a, 145; micropylar cup, Mattingly 1969a, 13; apical cup, Mattingly 1969a, 14; apical frill, Mattingly 1972c, 114; outer-chorionic frill, Mattingly 1972c, 119.)

corrugations. -- See FLOAT RIDGE.

covering. -- See CHORION.

crown (Kranz). -- See MICROPYLAR COLLAR.

cup. -- See COROLLA and micropylar apparatus.

cushion. -- See MICROPYLAR COLLAR.

cylindrical knob. -- See COROLLA.

cylindrico-conical projections. -- See OUTER CHORIONIC TUBERCLE.

DECK (De) (Figs. 82a; 85e; 86a). -- In many anopheline eggs (Christophers 1916, 492), the tuberculate outer chorion of the ventral surface which normally is not covered by water and is completely or incompletely enclosed by the frill; sometimes divided so that in effect there are two decks, one anterior and one posterior. In the eggs of species of *Hodgesia* (Mattingly and McCrae 1977, 334), *Mimomyia* (Mattingly 1970e, 161), *Orthopodomyia* (Mattingly 1971a, 66), and *Deinocerites* (Mattingly 1973) that part of the ventral surface enclosed by the frill (or the flange in the case of *Orthopodomyia*). (Syn. for anopheline eggs: anterior surface, Stephens and Christophers 1902a, 12; upper surface, Stephens and Christophers 1902a, 11; demarcated areas, Christophers and Barraud 1931, 164; anterior demarcated area, Christophers 1933, in part, 46; posterior demarcated area, Christophers 1933, in part, 46; enclosed surface, Evans 1938, 35; enclosed area, Evans 1938, 86; flat median ridge, Sasa *et al.* 1971, 141.)

DECK TUBERCLE (DeT) (Fig. 82a). -- In anopheline eggs (Hinton 1968b, 497), one of the outer chorionic tubercles which ornament the deck. A variable number of large tubercles with notched or convoluted margins are located at either end of the deck and are referred to as lobed tubercles. (Syn.: minute reticulations, Nuttall and Shipley 1901, 49; processes, Nicholson 1921, 408; dorsal processes, Nicholson 1921, in part, 446; collumella, de Buck and Swellengrebel 1932, 1336; granulation, Herms and Frost 1932, in legend to Fig. 15; granular elevations, Hurlbut 1938, 523.) See LOBED TUBERCLE and OUTER CHORIONIC TUBERCLE. Also see appendix entry OUTER CHORIONIC TUBERCLE.

DEHISCENCE. -- In insects, the splitting of the chorion in the emergence of the nymph or larva. Four modes of dehiscence occur in mosquito eggs (see the works of Mattingly):

LONGITUDINAL DEHISCENCE. -- The splitting of the chorion in the direction of the long axis of the egg.

OBLIQUE DEHISCENCE. -- The splitting of the chorion in a plane forming an acute angle to the longitudinal axis of the egg.

SPIRAL DEHISCENCE. -- The transverse splitting of the chorion of an egg in constantly changing planes (helical).

TRANSVERSE DEHISCENCE. -- The splitting of the chorion of an egg in a plane perpendicular to the longitudinal axis.

Adjectives used to qualify the types of dehiscence include apical (=capsular, Iyengar 1969, 214), subapical, equatorial, complete, and incomplete.

demarcated areas. -- See DECK.

DENTICLE (D). -- In the eggs of *Mansonia* species (Boreham 1970, 385), one of the tiny toothlike projections of the inner chorion (Mattingly 1972b, 53) located inside the micropylar collar. (Syn.: projections, Lincoln 1965, 13; teeth, Mattingly 1972b, 54.)

diameter. -- See EGG WIDTH.

disc. -- See INNER CHORIONIC CELL, MICROPYLAR DISC and MICROPYLAR MOUND.

discs. -- See OUTER CHORIONIC TUBERCLE.

dorsal egg surface. -- See DORSAL SURFACE under ORIENTATION.

dorsal frill. -- See FRILL.

dorsal processes. -- See DECK TUBERCLE and FRILL.

dorsal side. -- See VENTRAL SURFACE under ORIENTATION.

dorsal side (lado dorsal). -- See DORSAL SURFACE under ORIENTATION.

dorsal surface. -- See VENTRAL SURFACE under ORIENTATION.

dorsoventral diameter. -- First used by Horsfall *et al.* (1952, 619) as a measurement of depth for eggs of *Psorophora* species. May be defined as the maximum depth of an egg measured along a straight dorsoventral line lying perpendicular to the line of projection for the egg length. (Syn.: maximum dorsoventral diameter, Myers 1967, 795; greatest dorsoventral diameter, Myers 1967, 798.) See EGG WIDTH.

dorsum. -- See DORSAL SURFACE under ORIENTATION.

dots. -- See OUTER CHORIONIC TUBERCLE.

EGG. -- As regarded herein, the first life stage of an insect. (Syn.: ovum, Nuttall and Shipley 1901, 49.)

egg-batch. -- See EGG BATCH.

EGG BATCH. -- In Culicidae (=egg batches, Kumm 1941, 93), the group of eggs deposited by the female during a single laying. The floating egg batch consisting of eggs which are laterally attached to one another in species of *Coquillettidia*, *Culex*, *Culiseta*, *Trichoprosopon*, and *Uranotaenia* is termed an egg raft. (Syn.: lot, Howard 1900a, 8; batch, Mitchell 1907, 140; egg-batch, Theodor 1924, 377.) See EGG RAFT.

egg-boat. -- See EGG RAFT.

egg boat. -- See EGG RAFT.

egg-cap. -- See EGG CAP.

egg cap. -- See COROLLA.

EGG CAP (EC). -- In mosquito eggs (=Eikalotte, Bresslau 1920, 348), the usually small anterior lidlike portion of the chorion which may completely or incompletely separate from the posterior part following oblique, spiral, or transverse dehiscence. (Syn.: lid, Hurst 1890, 50; trap-door, Hurst 1890, 50; cap, Nuttall and Shipley 1901, 51; operculum, Banks 1908, 251; egg lid (Eideckel), Bresslau 1920, 348; egg-cap, Christophers 1945, 26; hatching cap, Frohne 1953, 113; apical cap, Mattingly 1970b, 63; anterior cap, Mattingly and McCrae 1977, 334.)

egg-capsule. -- See CHORION.

egg chorion reticulation. -- See INNER CHORIONIC RETICULUM.

egg-cluster. -- See EGG RAFT.

egg cluster. -- See EGG RAFT.

egg dorsum. -- See DORSAL SURFACE under ORIENTATION.

EGG LENGTH. -- In culicid eggs (=Eilänge, Bresslau 1920, 343), the maximum distance measured along a straight line between the anterior and posterior extremities. (Syn.: length, Howard 1896, 12; greatest length, Strickland 1914, 321.)

EGG LENGTH/WIDTH RATIO (l/w). -- In culicid eggs, the numerical value obtained by dividing the egg width into the egg length. (Syn.: length/breadth ratio, Mattingly 1969a, 13; length/width ratio, Mattingly 1971d, 205; l/w ratio, Mattingly 1971d, 205; length:diameter ratio, Horsfall and Voorhees 1972, 125.) See EGG LENGTH and EGG WIDTH.

egg lid (Eideckel). -- See EGG CAP.

egg-mass. -- See EGG RAFT.

egg mass. -- See EGG RAFT.

egg membrane (Eihäute). -- See CHORION.

egg pole (Eipol). -- See ANTERIOR END under ORIENTATION.

egg-raft. -- See EGG RAFT.

EGG RAFT. -- In the culicine genera *Coquillettidia*, *Culex* (Stephens and Christophers 1903, 67), *Culiseta*, *Trichoprosopon*, and *Uranotaenia*, the floating mass of laterally cohering, vertically oriented eggs. (Syn.: raft (radeau), de Réaumur 1738, 615; boat (bateau), de Réaumur 1738, 615; egg-raft, Miall 1895, 112; mass, Howard 1896, 11; egg-mass, Howard 1896, 11; egg mass, Howard 1896, 11; egg-boat, James and Liston 1904, 7; raft mass, James and Liston 1904, in legend to plate I in text; cluster, Knab 1904, 246; egg-cluster, Knab 1904, 247; egg cluster, Knab 1904, 248; egg boat, Mitchell 1907, 155; clutch, Aitken *et al.* 1968, 452.) See EGG BATCH.

egg sculpturing. -- See OUTER CHORIONIC SCULPTURE.

eggshell. -- See CHORION and INNER CHORION.

egg-shell. -- See CHORION and INNER CHORION.

egg shell. -- See CHORION and INNER CHORION.

egg-spike. -- See MICROPYLAR PLUG.

"egg spike". -- See MICROPYLAR PLUG.

EGG WIDTH. -- For culicid eggs, the greatest side to side distance measured along a straight line lying in a plane perpendicular to the line of projection for the egg length. (Syn.: diameter, Howard 1896, 12; greatest breadth, Nuttall and Shipley 1901, 49; greatest width, Dyar and Currie 1904, 219; width (largura), Goeldi 1905, 94; breadth, Theobald 1907, 107; maximum breadth, Gillies 1955, 158; maximum diameter, Newkirk 1955, 61; maximum width, Zavortink 1968, 26.) This measure should be used instead of the "dorsoventral diameter" of Horsfall *et al.* (1952, 619). See dorsoventral diameter.

elements (elementos). -- See OUTER CHORIONIC TUBERCLE.

elevations. -- See OUTER CHORIONIC TUBERCLE.

"endbulbs". -- See LOBED TUBERCLE.

end "bulbs". -- See LOBED TUBERCLE.

enclosed area. -- See DECK.

enclosed surface. -- See DECK.

endochorion. -- See OUTER CHORION.

endochorion (Endochorion). -- See INNER CHORION.

endochorionic lobe. -- See MICROPYLAR MOUND.

endochorionic pillars. -- See OUTER CHORIONIC TUBERCLE.

endochorionic reticulation. -- See INNER CHORIONIC RETICULUM.

enveloping layer. -- See OUTER CHORION.

enveloping membrane. -- See OUTER CHORION.

excrescences. -- See OUTER CHORIONIC TUBERCLE.

exochorial bosses. -- See OUTER CHORIONIC TUBERCLE.

exochorial facet. -- See OUTER CHORIONIC CELL.

exochorial membrane (membrane exochoriale). -- See OUTER CHORION.

exochorial network. -- See OUTER CHORIONIC RETICULUM.

exchorion (Exochorion). -- See OUTER CHORION.

exochorionic "bosses". -- See OUTER CHORIONIC TUBERCLE.

exochorionic markings. -- See OUTER CHORIONIC SCULPTURE.

exochorionic papillae. -- See OUTER CHORIONIC TUBERCLE.

exochorionic pattern. -- See OUTER CHORIONIC SCULPTURE.

exochorionic processes. -- See OUTER CHORIONIC TUBERCLE.

exochorion projections. -- See OUTER CHORIONIC TUBERCLE.

exochorion sculpturing. -- See OUTER CHORIONIC SCULPTURE.

extra-chorial rim. -- See FRILL.

external membrane. -- See OUTER CHORION.

faces. -- See INNER CHORIONIC CELL.

facet. -- See OUTER CHORIONIC CELL.

FLANGE (Fg). -- In *Orthopodomyia* eggs (Marshall 1938, 36), one of the flattened longitudinal ribs borne on either side of the egg; bearing a series of holes, lacunae, traversed by little bars, transverse trabeculae (Mattingly 1970e, 161). (Syn.: transverse ridges, Howard *et al.* 1917, 890; veined gelatinous veil, Zavortink 1968, 26; lateral flange, Mattingly 1970e, 160.) See appendix.

flat median ridge. -- See DECK.

FLOAT (F) (Figs. 82a,b,c; 86a). -- In anopheline eggs (Nuttall and Shipley 1901, 74), a narrow, longitudinal portion of outer chorion containing a hollow space and bearing a series of transverse ridges on its outer wall; multiple floats occur in *Chagasia* eggs otherwise two is the usual number, one on either side and at varying distances from the ventral midline. (Syn.: clasping membrane, Howard 1900b, in part, 36; rim, Nuttall and Shipley 1901, 49; lateral floats, Stephens and Christophers 1902b, 5; air cells, Stephens and Christophers 1903, 69; lateral appendages (appendices lateraes), Goeldi 1905, 130; wings (azas), Goeldi 1905, 130; lateral wings (abas lateraes), Goeldi 1905, in legend to fig. 131, pl. 0; lateral membranous puffs, Mitchell 1907, in key, 216; frill-float, Christophers 1916, 492; flotation apparatus (Schwimmapparat), Bresslau 1920, 342; air bladders (Schwimmbblasen), Bresslau 1920, 343; air-floats, Theodor 1925, 377; air-pockets, Gibbins 1933, in part, 258; peripheral frill, Mattingly 1971e, 35; air floats, Gutsevich *et al.* 1974, 17.)

float-chambers. -- See FLOAT RIDGE.

float chambers. -- See FLOAT RIDGE.

FLOAT LENGTH. -- In anopheline eggs (Rozeboom 1937, 538), the maximum length of one of the floats measured along a straight line from its anterior to its posterior margin. (Syn.: length of the float, Herms and Freeborn 1920, 73; length of lateral floats, Gibbins 1933, 262; length of floats, Hurlbut 1938, 523.)

FLOAT LENGTH/EGG LENGTH RATIO (f/e). -- In the anopheline egg with a pair of floats, the decimal fraction obtained by dividing the egg length into the float length. (Syn.: length of float/length of egg, D'Abbrera 1944, 342.)

float ribs. -- See FLOAT RIDGE.

FLOAT RIDGE (FR) (Figs. 82a; 85e). -- In anopheline eggs (Christophers and Barraud 1931, 164), one of the raised sections of a float; appearing membranous in slide preparations as compared to the grooves on either side. (Syn.: wrinkles, Howard 1900b, 36; air chambers, Nuttall and Shipley 1901, 49; ribbing, Nuttall and Shipley 1901, 49; air cells, Stephens and Christophers 1903, 221; tubes (tubos), Goeldi 1905, 130; corrugations, Stanton 1913, 131; frills, Strickland 1914, 322; compartments, Herms and Freeborn 1920, 74; air-cells, Theodor 1925; 377; chambers, Patton and Evans 1929, 256; ridges, Christophers and Barraud 1931, 164; float-ridges, Christophers 1933, 46; air-chambers, Gibbins 1933, 258; cells, Gibbins 1933, 260; striae, Evans 1938, 34; intercostal membranes, Bates and Hackett 1939, 1556; float-chambers, Gillies 1955, 158; float ribs, Reid 1962, 33; ribs, Hinton 1968b, 497; float chambers, Mattingly 1969b, 41; striations, Mattingly 1969b, 41.) See appendix.

FLOAT RIDGE NUMBER. -- In the anopheline egg with a pair of floats, the number of float ridges per float. (Syn.: rib number (Rippenzahl), Bresslau 1920, 343; number of float ridges, Rozeboom 1938, 98; number of ribs, Hinton 1968b, 504.)

float-ridges. -- See FLOAT RIDGE.

float-termination. -- See float termination.

float termination. -- In float-bearing anopheline eggs (Christophers and Barraud 1931, defined, 166), the flattened terminal compartment at either end of the float. (Syn.: float-termination, Christophers 1933, 46.)

FLOAT WIDTH. -- In the anopheline egg with a pair of floats, the maximum distance along a straight line from the dorsal to the ventral margin of the float. (Syn.: width of floats, Hinton 1968b, 503.)

flotation apparatus (Schwimmapparat). -- See FLOAT.

flotation funnel (Schwimmtrichter). -- See COROLLA and MICROPYLAR COLLAR.

frill. -- See COROLLA.

FRILL (Fr) (Figs. 82a,b,c; 85e; 86a, b). -- In many anopheline eggs (Stephens and Christophers 1902a, 12) and eggs of the genera *Hodgesia* (Mattingly and McCrae 1977, 334) and *Mimomyia*, a narrow, usually ribbed, ridgelike formation

of the outer chorion located on or near the ventral surface and commonly enclosing an area termed the "deck." In anopheline eggs, the frill may 1) completely or incompletely enclose an undivided deck, 2) in essence be two frills, one surrounding the anterior part and the other the posterior part of a divided deck, or 3) have the form of a collar around the anterior or posterior end of the egg. In the *Hodgesia* egg, a short frill encloses a narrow deck on the ventral surface at the posterior end, and in *Mimomyia* eggs the frill completely encloses an undivided deck. (Syn. for *Mimomyia* eggs: peripheral frill, Mattingly 1970e, 161. Syn. for anopheline eggs: clasping membrane, Howard 1900b, in part, 36; fringe-like structure, Stephens and Christophers 1902a, 11; fringe, Stephens and Christophers 1902a, 12; rim, Stephens and Christophers 1903, 69; wings (abas), Goeldi 1905, in legend to fig. 123 [sic, = 132], pl. 0; attached edge of membrane, Mitchell 1907, in key, 216; frilled cuticle, Strickland 1914, 321; dorsal processes, Nicholson 1921, in part, 446; air-pockets, Gibbins 1933, in part, 258; collar, Gibbins 1933, 261; dorsal frill, Kumm 1941, 95; anterior collar, Causey *et al.* 1944, 3; posterior collar, Causey *et al.* 1944, 3; extra-chorial rim, Newkirk 1955, 62.)

frilled cuticle. -- See FRILL.

frill-float. -- See FLOAT.

frills. -- See FLOAT RIDGE.

fringe. -- See COROLLA and FRILL.

fringe-like structure. -- See FRILL.

funnel. -- See micropylar funnel.

gelatinous covering. -- See OUTER CHORION.

gelatinous membrane. -- See OUTER CHORION.

general surface. -- See DORSAL SURFACE under ORIENTATION.

globular structures. -- See LOBED TUBERCLE.

granular elevations. -- See DECK TUBERCLE.

granulation. -- See DECK TUBERCLE.

granulations. -- See OUTER CHORIONIC TUBERCLE.

granules. -- See OUTER CHORIONIC TUBERCLE.

greatest breadth. -- See EGG WIDTH.

greatest dorsoventral diameter. -- See dorsoventral diameter.

greatest length. -- See EGG LENGTH.

greatest width. -- See EGG WIDTH.

hairs. -- See OUTER CHORIONIC TUBERCLE.

hatching cap. -- See EGG CAP.

head end (Kopfende). -- See ANTERIOR END under ORIENTATION.

hemispherical bodies. -- See OUTER CHORIONIC TUBERCLE.

hemispherical translucent projections. -- See OUTER CHORIONIC TUBERCLE.

hexagonal areas. -- See OUTER CHORIONIC CELL and polygonal cell.

hexagonal pattern. -- See OUTER CHORIONIC SCULPTURE.

hexagonal reticulations. -- See OUTER CHORIONIC RETICULUM.

hexagons. -- See OUTER CHORIONIC CELL.

HORN(H). -- In the eggs of *Mansonia humeralis* (Dyar and Knab 1916, 63), perhaps other *Mansonia* eggs as well, one of the elongate pointed projections arising at the anterior end. The relationship of the horns to the micropylar collar is presently unknown. (Syn.: apical horns, Mattingly 1972a, 47.)

hummocks. -- See OUTER CHORIONIC TUBERCLE.

inferior end (bout inférieur). -- See POSTERIOR END under ORIENTATION.

INNER CHORION (IC). -- In culicid eggs (Mattingly 1969c, 74), the innermost of usually two layers of chorion secreted by the follicular epithelium; with a smooth outer surface in anophelines, toxorhynchitines, and many culicines; sculptured in most aedines. (Syn.: chorion (Chorion), Leuckart 1855, 135; shell, Mitchell 1907, 11; endochorion (Endochorion), Bresslau 1920, 340; inner wall, Nicholson 1921, 507; egg shell, Pawan 1922a, 64; vitelline membrane, Nath 1924, 157; eggshell, de Buck and Swellengrebel 1932, 1337; chorionic envelope, Evans 1938, 34; egg-shell, Christophers 1945, 26; inner layer, Newkirk 1955, 61; main shell, Harwood 1958, 464.) See appendix entry CHORION.

INNER CHORIONIC CELL (ICC) (Figs. 83c, 85d). -- In many culicid eggs, mainly those of aedine species, an area of the inner chorion bounded by elements of the inner chorionic reticulum; differing in shape in different areas of the surface. For brevity, CELL may be used when referring to the inner chorion or inner chorionic sculpture. (Syn.: central area, Horsfall *et al.* 1952, 620; disc, Horsfall *et al.* 1952, 620; center portion, Horsfall *et al.* 1952, 622; intracellular spaces, Craig and Horsfall 1960, 14; faces, Horsfall *et al.* 1970, 1713; polygonal disc, Olson and Meola 1976, 96.) See appendix entry CELL.

INNER CHORIONIC RETICULUM (ICR) (Figs. 83c, 85d). -- In many culicid eggs, particularly those of aedine species (Mattingly 1970c, 88), a feature of the

inner chorionic sculpture consisting of an interconnected system of ridges which separates adjacent inner chorionic cells; corresponding exactly with the boundaries of the follicular epithelial cells which secrete the chorion. This structure may be referred to simply as a RETICULUM depending upon circumstance and usability. (Syn.: reticulation, Horsfall and Craig 1956, 370; chorionic reticulation, Craig and Horsfall 1958, 856; cellular reticulation, Craig and Horsfall 1960, 12; egg chorion reticulation, Reinert 1972b, 89; endochorionic reticulation, Olson and Meola 1976, 96.)

INNER CHORIONIC SCULPTURE (ICS) (Fig. 83c). -- In many culicid eggs, primarily aedine eggs, the pattern of impressed and raised markings of the inner chorion; usually consisting of cells bounded by a ridgelike reticulum. (Syn.: chorionic markings, Horsfall and Craig 1956, 368; surface sculpturing, Horsfall and Craig 1956, 370; chorionic sculpturing, Craig and Horsfall 1960, 11; chorionic sculpture, Lincoln 1965, 9; chorionic pattern, Myers 1967, 795; reticulated pattern, Aitken *et al.* 1968, 452; chorion sculpturing, Reinert 1972a, 60; surface pattern, Brust 1974, 466.)

inner layer. -- See INNER CHORION.

inner wall. -- See INNER CHORION.

intercostal membranes. -- See FLOAT RIDGE.

intracellular spaces. -- See INNER CHORIONIC CELL.

investing capsule. -- See OUTER CHORION.

knob. -- See MICROPYLAR MOUND.

knobs. -- See LOBED TUBERCLE and OUTER CHORIONIC TUBERCLE.

large end (gros bout). -- See ANTERIOR END under ORIENTATION.

lateral appendages (appendices lateraes). -- See FLOAT.

lateral flange. -- See FLANGE.

lateral floats. -- See FLOAT.

lateral membranous puffs. -- See FLOAT.

lateral wings (abas lateraes). -- See FLOAT.

length. -- See EGG LENGTH.

length/breadth ratio. -- See EGG LENGTH/WIDTH RATIO.

length:diameter ratio. -- See EGG LENGTH/WIDTH RATIO.

length of float/length of egg. -- See FLOAT LENGTH/EGG LENGTH RATIO.

length of floats. -- See FLOAT LENGTH.

length of lateral floats. -- See FLOAT LENGTH.

length of the float. -- See FLOAT LENGTH.

length/width ratio. -- See EGG LENGTH/WIDTH RATIO.

lid. -- See EGG CAP.

lid (tampa). -- See micropylar apparatus.

lip. -- See MICROPYLAR MOUND.

LOBED TUBERCLE (LoT) (Figs. 82a,b; 85e; 86b). -- In anopheline eggs (Hinton 1968b, 497), one of a variable number of large deck tubercles with notched margins that are usually located at the anterior and posterior ends of the deck. (Syn.: circular spots, Howard 1900b, 36; polygonal areas, Stephens and Christophers 1903, 221; knobs, Mitchell 1907, in key, 216; 'bosses', Nicholson 1921, 406; process, Nicholson 1921, 408; nodules, Christophers and Barraud 1931, 165; end "bulbs", Herms and Frost 1932, 242; globular structures, Herms and Frost 1932, 242; "endbulbs", Herms and Frost 1932, in legend to Fig. 12; tubercles, Christophers 1933, 46; terminal "bulbs", Matheson and Hurlbut 1937, 242; circular structures, Hurlbut 1938 523; anterior bosses, D'Abrera 1944, 341; posterior bosses, D'Abrera 1944, 341.) See DECK TUBERCLE. Also see appendix entry OUTER CHORIONIC TUBERCLE.

lot. -- See EGG BATCH.

lower (anterior) end. -- See ANTERIOR END under ORIENTATION.

lower (dorsal) surface. -- See DORSAL SURFACE under ORIENTATION.

lower end. -- See ANTERIOR END under ORIENTATION.

lower portion. -- See DORSAL SURFACE under ORIENTATION.

lower side. -- See DORSAL SURFACE under ORIENTATION.

lower surface. -- See DORSAL SURFACE under ORIENTATION.

l/w ratio. -- See EGG LENGTH/WIDTH RATIO.

main outer chorionic papilla. -- See OUTER CHORIONIC TUBERCLE.

main shell. -- See INNER CHORION.

mammilla (mammillão). -- See OUTER CHORIONIC TUBERCLE.

mass. -- See EGG RAFT.

maximum breadth. -- See EGG WIDTH.

maximum breadth [excluding floats]. -- The maximum width of an anopheline egg exclusive of the floats (Lee and Woodhill 1944, 117).

maximum diameter. -- See EGG WIDTH.

maximum dorsoventral diameter. -- See dorsoventral diameter.

maximum width. -- See EGG WIDTH.

median area. -- In anopheline eggs (Christophers 1933, 46), the area of the ventral surface between the two parts of a divided deck.

membrane. -- See OUTER CHORION.

membranous covering. -- See OUTER CHORION.

membranous sheath. -- See OUTER CHORION.

meshes. -- See OUTER CHORIONIC CELL.

mesh-like areas. -- See OUTER CHORIONIC RETICULUM.

meshwork. -- In culicid eggs (James 1923, 9), the system of cells belonging to the outer chorion; can also be applied to the inner chorionic system. (Syn.: reticular meshwork, Mattingly 1971c, 130.)

micropilar apparatus. -- See COROLLA.

micropilar area. -- See micropylar area and MICROPYLAR DISC.

micropilar cup. -- See COROLLA.

micropilar end. -- See ANTERIOR END under ORIENTATION.

micropilar funnel. -- See micropylar tube.

micropile. -- See MICROPYLE.

micropylar apparatus. -- Commonly used in the sense of Evans (1938, 34) for the modified outer chorion surrounding the micropyle and comprising the micropylar disc and collar. The "micropylar apparatus" of Nath (1924, 152) probably included her "micropylar funnel" and our micropylar disc. Harwood and Horsfall (1957, 558) applied the term to the corolla of *Culex* and Hinton (1968a, 148) used it to designate the micropylar plug. (Syn. for the micropylar apparatus of Evans (1938): stopping (rolhamento), Goeldi 1905, 94; lid (tampa), Goeldi 1905, in legend to fig. 41, pl. E; shutting up apparatus (apparelhode fechamento), Goeldi 1905, in legend to fig. 87, pl. H; micropyle apparatus (Mikropyleapparat), Bresslau 1920, 346; micropylar cup, Mattingly 1970d, 97; cup, Mattingly 1970e, 161; apical cup, Mattingly 1971a, 66; micropyle, Gutsevich *et al.* 1974, 16.) See COROLLA, MICROPYLAR COLLAR, MICROPYLAR DISC, micropylar funnel and MICROPYLAR PLUG.

micropylar area. -- In mosquito eggs (Christophers 1960, 136), an undefined part of the surface of a culicid egg in the vicinity of the micropyle. (Syn.: micropilar area, De Meillon 1934, 272; micropylar region, Baerg and Boreham 1974, 632.)

MICROPYLAR COLLAR (MiC) (Figs. 82b; 83a,b; 85c; 86b). -- In many mosquito eggs (Hinton 1968b, 498), the prominent, usually thickened and darkened annular wall or ridge surrounding the micropylar disc. (Syn.: crown (Kranz), Leuckart 1855, 136; wings (azelhas), Goeldi 1905, in part, 94; vesicles (vesiculas), Goeldi 1905, in part, in legend to fig. 30, pl. C; cushion, Howard *et al.* 1917, 534; flotation funnel (Schwimmtrichter), Bresslau 1920, 338; collar, Herms and Freeborn 1920, 75; supporting ring, Nicholson 1921, 409; micropylar apparatus, Evans 1938, in part, 34; ring, Marshall 1938, 32; ring of pellicle, Horsfall *et al.* 1952, 620; pillicular ring, Harwood and Horsfall 1957, 558; apical corolla, Mattingly 1970a, 17; apical collar, Mattingly 1970c, 91; annular ridge, Gutsevich *et al.* 1974, 16.)

micropylar cup. -- See COROLLA and micropylar apparatus.

micropylar disc. -- See MICROPYLAR DISC.

MICROPYLAR DISC (MiD) (Figs. 82b; 83b; 85c; 86b). -- In many culicid eggs, an area of modified outer chorion surrounding the micropyle. It may be thin, thick or bear a raised area around the micropyle. It is often surrounded by a micropylar collar, but this may be absent, e.g., in *Armigeres dentatus* (Mattingly 1971b, 125). (Syn.: disc, Nicholson 1921, 409; micropylar apparatus, Nath 1924, in part, 152 and Evans 1938, in part, 34; supporting ring, Nath 1924, in part, 157; micropylar disc, Nath 1924, in part, 158; micropilar area, Christophers and Barraud 1931, 167; apical disc, Iyengar 1935, 424; sclerotized disc, Mattingly 1970d, 94.) See appendix.

micropylar end. -- See ANTERIOR END under ORIENTATION.

micropylar funnel. -- Used by Nath (1924, 158) as a term for the anatomical passage or channel through the chorion whose cavity is defined as the micropyle. (Syn.: funnel, Nicholson 1921, 409; micropylar apparatus, Patton and Evans 1929, 250; canal, Gutsevich *et al.* 1974, 16. The "micropylar apparatus" of Nath (1924, 152) probably included the micropylar funnel as well as the micropylar disc defined herein.)

MICROPYLAR MOUND (MiM). -- In certain *Culex* and *Psorophora* eggs, perhaps others as well, a dome or lobe of inner chorion which lies directly under the micropylar disc and is pierced at its center by the micropyle. (Syn.: knob, Mitchell 1907, in key, 217; projection (Vorsprung), Bresslau 1920, 340; micropylar process, Patton and Evans 1929, 250; micropyle mound, Horsfall *et al.* 1952, 620; papilla, Berlin and Pandian 1973, 227; endochorionic lobe, Mattingly 1976, 224; sclerotized lip, Mattingly 1976, 225; disc, Mattingly 1976, 226; lip, Mattingly 1976, 226.)

micropylar opening. -- See MICROPYLE.

MICROPYLAR PLUG (MiP). -- In many culicid eggs (Harwood and Horsfall 1957, 558), a piece of inner chorion which obstructs or fills in the micropyle. (Syn.: spine, Banks 1908, 251; protuberance, Banks 1908, 251; stopper, Nicholson 1921, 409; egg-spike, Christophers 1945, 25; plug, Harwood and Horsfall 1957, 560; micropyle plug, Clements 1963, 26 in Figs. 16a,c; "egg spike", Lincoln 1965, 10; micropylar apparatus, Hinton 1968a, 148.)

micropylar process. -- See MICROPYLAR MOUND.

micropylar region. -- See micropylar area.

micropylar tube. -- In unlaidd and newly laid *Culex* eggs (Nath 1924, 158), the channel or passage extending through the degenerating nurse cells; continuous with the micropylar funnel; its cavity is by nature a portion of the micropyle. (Syn.: micropilar funnel, Christophers 1945, 27; micropyle channel, Clements 1963, 26 in Fig. 16c; micropyle funnel, Clements 1963, 27.)

micropyle. -- See micropylar apparatus.

MICROPYLE (Mi) (Figs. 82b; 83b; 84b; 85c; 86b,d). -- In insect eggs, one or more minute openings in the chorion through which spermatozoa enter; in mosquito eggs (Leuckart 1855, 135), a single pore located at the anterior end which is often filled with a micropylar plug and surrounded by a micropylar disc. (Syn. for culicid eggs: micropile, Christophers and Barraud 1931, 164; micropylar opening, Harwood and Horsfall 1957, 560.)

micropyle apparatus (Mikropyleapparat). -- See micropylar apparatus.

micropyle channel. -- See micropylar tube.

micropyle cup. -- See COROLLA.

micropyle funnel. -- See micropylar tube.

micropyle mound. -- See MICROPYLAR MOUND.

micropyle plug. -- See MICROPYLAR PLUG.

minute reticulations. -- See DECK TUBERCLE.

narrow pole (polo delgado). -- See POSTERIOR END under ORIENTATION.

neck. -- See apical process.

neck (col). -- See COROLLA.

network. -- See OUTER CHORIONIC RETICULUM.

nodules. -- See LOBED TUBERCLE and OUTER CHORIONIC TUBERCLE.

number of float ridges. -- See FLOAT RIDGE NUMBER.

number of ribs. -- See FLOAT RIDGE NUMBER.

operculum. -- See EGG CAP.

ORIENTATION. -- In general, the first life stage of the mosquito is deposited so that it rests either longitudinally or vertically. In the longitudinally-laid egg, the morphologically dorsal surface of the developing embryo is opposite the lower surface of the egg. Likewise, the venter of the larva opposes the upper surface. In the vertically-laid egg, the lateral surface corresponding to the upper surface of the horizontally-laid egg can sometimes be determined on the basis of curvature and dehiscence but is for the most part unrecognizable.

In anophelines and culicines the end of the egg bearing the micropyle is usually slightly broader than the opposite end. In species forming egg rafts, the micropylar end is located at the inferior extremity of the egg. In the toxorhynchitine egg, the micropyle is borne at the superior end. The micropyle is always opposite the head of the embryo.

ANTERIOR END. -- The end of the culicid egg bearing the micropyle; adjacent to the head of the embryo (=vordere Ende, Leuckart 1855, 135). (Syn.: large end (gros bout), de Réaumur 1738, 616; anterior pole (vordern Pole), Leuckart 1855, 135; upper egg pole (oberer Eipole), Leuckart 1855, 254; lower end, Hurst 1890, 49; micropylar end, Dyar 1901, 180; blunt pole (polo rombo), Goeldi 1905, 88; pole (Pol), Bresslau 1920, 338; egg pole (Eipol), Bresslau 1920, 240; head end (Kopfende), Bresslau 1920, 345; anterior egg pole (vorderen Eipole), Bresslau 1920, 247; micropylar end, James 1922, 267; lower (anterior) end, Christophers 1945, 30; cephalic end, Zavortink 1968, 26; apical end, Mattingly 1971d, 202; anterior tip, Mattingly 1972c, 116.)

DORSAL SURFACE.-- The surface of the culicid egg opposite the dorsum of the embryo (Christophers and Barraud 1931, 164); corresponding to the lower surface of the horizontally-laid egg. (Syn.: under surface, Nuttall and Shipley 1901, 49; lower surface, Stephens and Christophers 1902a, 12; dorsum, James and Liston 1904, 38; dorsal side (lado dorsal), Goeldi 1905, 88; lower side, Mitchell 1907, 100; ventral surface, Nicholson 1921, 407; lower portion, Pawan 1922a, 64; under-surface, Evans and Leeson 1935, 37; convex surface, Evans and Leeson 1935, 37; general surface, Evans 1938, including lateral surfaces, 34; ventral side, Abdel-Malek 1949, 19; back, Newkirk 1955, 61; lower (dorsal) surface, Mattingly 1970e, 162; egg dorsum, Boreham and Baerg 1974, 564; dorsal egg surface, Tompkins and Williams 1977, 109.)

POSTERIOR END. -- In the culicid egg, the extremity opposite the end bearing the micropyle; opposed to the hindmost part of the embryo (Bresslau 1920, 342). (Syn.: inferior end (bout inférieur), de Réaumur 1738, 621; upper end, Miall 1895, 113; tip, Howard 1896, 12; narrow pole (polo delgado), Goeldi 1905, 88; tail end (Schwanzende), Bresslau 1920, 345; poles, Gibbins 1933, in part, 257; posterior pole, Gibbins 1933, 260; posterior tip, Rozeboom 1937, 538; apical (posterior) end, Mattingly 1970a, 19.)

VENTRAL SURFACE. -- The surface of the culicid egg opposite the venter of the embryo (Christophers and Barraud 1931, 164); the upper surface of the horizontally-laid egg. (Syn.: ventral side (lado ventral), Goeldi 1905, 88; upper side (Oberseite), Bresslau 1920, 343; dorsal surface, Nicholson 1921, 407; dorsal side, Abdel-Malek 1949, 19; venter, Horsfall *et al.* 1952, 622; upper (ventral) surface, Christophers 1960, 132; upper surface, Christophers 1960, 132; upper face, Barr and Barr 1969, 193.)

ornamentation. -- See OUTER CHORIONIC SCULPTURE.

OUTER CHORION (OC). -- In culicid eggs (Mattingly 1969c, 74), the outermost of usually two layers of chorion secreted by the follicular epithelium; always sculptured and usually formed into a corolla and/or micropylar collar around the micropyle at the anterior end. (Syn.: exochorion (Exochorion), Leuckart 1855, 135; membrane, Nuttall and Shipley 1901, 49; pellicle (pellícula), Goeldi 1905, 88; gelatinous covering, Howard *et al.* 1917, 890; reticular membrane, Herms and Freeborn 1920, 73; outer wall, Nicholson 1921, 407; chorion, Nicholson 1921, 407; enveloping membrane, James 1922, 267; capsule, Pawan 1922a, 64; investing capsule, Pawan 1922a, 64; enveloping layer, James 1923, 9; membranous sheath, Gibbins 1933, 258; membranous covering, Gibbins 1933, 261; external membrane, Hurlbut 1938, 523; exochorial membrane (membrane exochoriale), Callot and Dao-Van-Ty 1942-1943, 145; outer layer, Newkirk 1955, 61; outer chorionic pellicle, Mattingly 1970b, 63; endochorion, Mathew and Rai 1975, 369.) See appendix entry CHORION.

outer chorionic cap. -- In certain culicid eggs (Mattingly 1971e, 34), particularly those of the genera *Trichoprosopon*, *Hodgesia*, and *Uranotaenia*, the set off posterior portion of the outer chorion, the anterior portion being relatively difficult to observe, unadorned, or absent. (Syn.: posterior outer chorionic "cap", Mattingly 1974, 234; posterior "cap", Mattingly 1974, 234; chorionic "cap", Mattingly 1974, 238; posterior cap, Mattingly and McCrae 1977, 234; posterior chorionic cap, Mattingly and McCrae 1977, 234.)

OUTER CHORIONIC CELL (OCC) (Figs. 83a; 84a,c; 85a; 86c,e,f). -- In many culicid eggs, an area of the outer chorion bounded by elements of the outer chorionic reticulum; differing in shape and relief in different areas of the surface. When referring to the outer chorion or outer chorionic sculpture, the term CELL may be used for brevity. (Syn.: hexagonal areas, Nuttall and Shipley 1901, 49; polygonal markings, Stephens and Christophers 1902a, 12; polygonal areas, James and Liston 1904, 39; hexagons, Mitchell 1907, 11; cells, Mitchell 1907, in key, 217; polygons (Polygone), Bresslau 1920, 342; meshes, de Buck and Swellengrebel 1932, 1338; facet, Newkirk 1955, 61; exochorial facet, Newkirk 1955, 61; polygonal fields, Hinton and Service 1969, 410; reticular meshes, Mattingly 1971a, 66; section, Matsuo *et al.* 1972, 360.) See appendix entry CELL.

outer-chorionic frill. -- See COROLLA.

outer chorionic ornamentation. -- See OUTER CHORIONIC SCULPTURE.

outer chorionic papillae. -- See OUTER CHORIONIC TUBERCLE.

outer chorionic pellicle. -- See OUTER CHORION.

OUTER CHORIONIC RETICULUM (OCR) (Figs. 83a; 85a,b). -- In many culicid eggs, a feature of the outer chorionic sculpture consisting of an interconnected system of ridges and/or tubercles, or an interrelated chain of unconnected tubercles, which separates adjacent outer chorionic cells; corresponding exactly with the boundaries of the follicular epithelial cells which secrete the chorion. This structure may be referred to simply as a RETICULUM depending upon circumstance and usability. (Syn.: reticulations, Nuttall and Shipley 1901, 49; reticular pattern, Stephens and Christophers 1903, 221; reticulation, Banks 1908, 257; hexagonal reticulations, Howard *et al.* 1917, 534; network, James 1923, 9; polygonal network, Christophers and Barraud 1931, 167; reticulum, Herms and Frost 1932, 241; exochorial network, Newkirk 1955, 61; air channel reticulum, Christophers 1960, 132; air channels, Christophers 1960, 136; air-channels, Christophers 1960, 136; chorionic reticulum, Mattingly 1970c, 88; reticular network, Mattingly 1971b, 123; chorionic reticulation, Mattingly 1971d, 204; pentagonal networks, Sasa *et al.* 1971, 141; ridged network, Matsuo *et al.* 1972, 358; ridge network, Matsuo *et al.* 1972, 359; mesh-like areas, Mathew and Rai 1975, 369.)

OUTER CHORIONIC SCULPTURE (OCS). -- In culicid eggs, the pattern of impressed and raised markings of the outer chorion; often consisting of cells bounded by a reticulum. (Syn.: sculpturing, Howard 1900b, 36; sculpture, Mitchell 1907, 11; air cell pattern, Banks 1908, 257; tessellation (Felderung), Bresslau 1920, 342; polygonal tessellation (polygonale Felderung), Bresslau 1920, 345; ornamentation, Christophers and Barraud 1931, 165; polygonal pattern, Kumm 1941, 96; hexagonal pattern, Lee and Woodhill 1944, 77; exochorionic pattern, Myers 1967, 795; exochorionic markings, Myers 1967, 796; egg sculpturing, Aitken *et al.* 1968, 453; surface pattern, Gillies and De Meillon 1968, 13; chorionic sculpturing, Barr and Barr 1969, 193; chorionic ornamentation, Mattingly 1969a, 13; surface ornamentation, Mattingly 1970c, 91; reticular ornamentation, Mattingly 1971a, 66; outer chorionic ornamentation, Mattingly 1973, 224; exochorion sculpturing, Berlin and Subramanian 1974, 265; reticular sculpturing, Mattingly 1975, 22.)

OUTER CHORIONIC TUBERCLE (OCT) (Figs. 82b; 83a,b; 84a,b,c; 85a,b; 86c,e,f). -- In culicid eggs, a small, rounded or irregularly shaped prominence of the outer chorion. When discussing or describing either the outer chorion or the outer chorionic sculpture, this structure may be referred to simply as a TUBERCLE. (Syn.: tubercles (Tuberkeln), Leuckart 1855, 135; bosses (Buckeln), Leuckart 1855, 135; granules, Dyar 1901, 181; air-chambers, Theobald 1901, 21; air cells, Stephens and Christophers 1903, 68; vesicles (vesiculas), Goeldi 1905, 19; air bubbles (camaras aéreas), Goeldi 1905, 19; elements (elementos), Goeldi 1905, 88; pearls (perolas), Goeldi 1905, 98; mammilla (mammillão), Goeldi 1905, 109; projection (saliencias), Goeldi 1905, in legend to fig. 117, pl. N; knobs, Mitchell 1907, 11; puffs, Mitchell 1907, 11; air-cells, Banks 1908, 254; air chambers, Banks 1908, 255; hairs, Busck 1908, 76; hemispherical bodies, Boyce 1910, 243; granulations, Howard *et al.* 1917, 637; callosities, Howard *et al.* 1917, 836; chorion processes, James 1922, 267; spots, De Meillon 1934, 273; stippling, De Meillon 1934, 274; small columns (Säulchen), de Buck 1938, 680; bladders (Blasen), de Buck 1938, 680; exochorionic "bosses", Marshall

1938, 31; exochorial bosses, Marshall 1938, 32; nodules, Marshall 1938, 36; elevations, Rozeboom 1938, 97; cylindrico-conical projections, Christophers 1945, 26; projections, Christophers 1945, 26; exochorion projections, Christophers 1945, 27; conical projections, Christophers 1945, 29; exochorionic papillae, Christophers 1945, 31; exochorionic processes, Christophers 1945, 31; blebs, Christophers 1945, 31; dots, Horsfall *et al.* 1952, 622; collumellae, Frohne 1953, 113; scales, Newkirk 1955, 62; hummocks, Christophers 1960, 132; chorionic bodies, Christophers 1960, defined, 133; tuberosities, Christophers 1960, 133; papillae, Christophers 1960, 135; refractive bodies, Christophers 1960, 136; accessory masses, Christophers 1960, 136; accessory bodies, Christophers 1960, 136; pegs, Christophers 1960, 153; vertical pillars, Lincoln 1965, 10; vertical projections, Lincoln 1965, 10; discs, Lincoln 1965, 13; excrescences, Aitken *et al.* 1968, 452; vertical knobs, Hinton 1968a, 147; vertical tubercles, Hinton 1968a, 148; outer chorionic papillae, Mattingly 1970b, 63; peripheral papillae, Mattingly 1970c, 88; main outer chorionic papilla, Mattingly 1970c, 88; conical spines, Mattingly 1971d, 204; circular warts, Berlin and Subramanian 1974, 263; pillar-like structures, Mathew and Rai 1975, 369; pillar-like elevations, Mathew and Rai 1975, 373; endochorionic pillars, Mathew and Rai 1975, 375; chorionic pillars, Mathew and Rai 1975, 379. The spiculelike outer chorionic tubercles of *Psorophora* eggs have been referred to as spines (espinhos) (Goeldi 1905, 118), "spine-like processes" (Mitchell 1907, 11), "spikelets" (Pawan 1922b, 482), and "spiculate projections" (Horsfall *et al.* 1952, 620). The modified outer chorionic tubercles which form a sort of crown around the corolla of *Tox. brevivalpis* have been called "projection," specifically "spiculate projections," by Muspratt 1957, 362. Outer chorionic tubercles occurring on the posterior end of *Uranotaenia* eggs have been referred to as "hemispherical translucent projections" by Belkin and McDonald (1956, 110) and as "refrangent papillae," "refrangent bodies," and "apical papillae" by Mattingly 1970b, 63.) See appendix.

outer layer. -- See OUTER CHORION.

outer wall. -- See OUTER CHORION.

ovum. -- See EGG.

papilla. -- See MICROPYLAR MOUND.

papillae. -- See OUTER CHORIONIC TUBERCLE.

papules. -- See CELLULE.

pearls (perolas). -- See OUTER CHORIONIC TUBERCLE.

pegs. -- See OUTER CHORIONIC TUBERCLE.

pellicle. -- See OUTER CHORION.

pellicular ring. -- See MICROPYLAR COLLAR.

pentagonal networks. -- See OUTER CHORIONIC RETICULUM.

peripheral frill. -- See FLOAT and FRILL.

peripheral papillae. -- See OUTER CHORIONIC TUBERCLE.

pillar-like elevations. -- See OUTER CHORIONIC TUBERCLE.

pillar-like structures. -- See OUTER CHORIONIC TUBERCLE.

plaques. -- See CELLULE.

plug. -- See MICROPYLAR PLUG.

pole (Pol). -- See ANTERIOR END under ORIENTATION.

poles. -- See POSTERIOR END under ORIENTATION.

polygonal areas. -- See LOBED TUBERCLE and OUTER CHORIONIC CELL.

polygonal cell. -- As used by Olson and Meola (1976, 96), a component of the inner chorion consisting of an inner chorionic cell as defined herein and the elements of the reticulum which enclose it. (Syn.: hexagonal areas, Horsfall *et al.* 1952, 622.)

polygonal cell margin. -- See cell boundaries.

polygonal disc. -- See INNER CHORIONIC CELL.

polygonal fields. -- See OUTER CHORIONIC CELL.

polygonal margin. -- See cell boundaries.

polygonal markings. -- See OUTER CHORIONIC CELL.

polygonal network. -- See OUTER CHORIONIC RETICULUM.

polygonal pattern. -- See OUTER CHORIONIC SCULPTURE.

polygonal tessellation (polygonale Felderung). -- See OUTER CHORIONIC SCULPTURE.

polygons (Polygone). -- See OUTER CHORIONIC CELL.

posterior bosses. -- See LOBED TUBERCLE.

posterior cap. -- See outer chorionic cap.

posterior "cap". -- See outer chorionic cap.

posterior chorionic cap. -- See outer chorionic cap.

posterior collar. -- See FRILL.

posterior demarcated area. -- See DECK.

posterior outer chorionic "cap". -- See outer chorionic cap.

posterior polar area. -- See posterior polar specialised area.

posterior polar depression. -- See posterior polar specialised area.

posterior polar specialised area. -- In the *Culex* egg (Christophers 1945, 25), a circular area of the outer chorion at the posterior end which bears tubercles of larger size and different shape than those borne on lateral areas. (Syn.: posterior polar area, Christophers 1945, 32; posterior specialized area, Newkirk 1955, 62; posterior polar depression, Hinton 1968a, in part, 148.)

posterior pole. -- See POSTERIOR END under ORIENTATION.

posterior specialized area. -- See posterior polar specialised area.

posterior tip. -- See POSTERIOR END under ORIENTATION.

process. -- See LOBED TUBERCLE.

processes. -- See DECK TUBERCLE.

projections. -- See DENTICLE and OUTER CHORIONIC TUBERCLE.

projection (saliencias). -- See OUTER CHORIONIC TUBERCLE.

projection (Vorsprung). -- See MICROPYLAR MOUND.

protuberance. -- See MICROPYLAR PLUG.

puffs. -- See OUTER CHORIONIC TUBERCLE.

raft (radeau). -- See EGG RAFT.

raft mass. -- See EGG RAFT.

raised bosses. -- See cell boundaries.

refractive bodies. -- See OUTER CHORIONIC TUBERCLE.

refrangent bodies. -- See OUTER CHORIONIC TUBERCLE.

refrangent papillae. -- See OUTER CHORIONIC TUBERCLE.

reticular membrane. -- See OUTER CHORION.

reticular meshes. -- See OUTER CHORIONIC CELL.

reticular meshwork. -- See meshwork.

- reticular network. -- See OUTER CHORIONIC RETICULUM.
- reticular ornamentation. -- See OUTER CHORIONIC SCULPTURE.
- reticular pattern. -- See OUTER CHORIONIC RETICULUM.
- reticular sculpturing. -- See OUTER CHORIONIC SCULPTURE.
- reticulated pattern. -- See INNER CHORIONIC SCULPTURE.
- reticulation. -- See INNER CHORIONIC RETICULUM and OUTER CHORIONIC RETICULUM.
- reticulations. -- See OUTER CHORIONIC RETICULUM.
- reticulum. -- See OUTER CHORIONIC RETICULUM.
- ribbing. -- See FLOAT RIDGE.
- rib number (Rippenzahl). -- See FLOAT RIDGE NUMBER.
- ribs. -- See FLOAT RIDGE.
- ridged network. -- See OUTER CHORIONIC RETICULUM.
- ridge network. -- See OUTER CHORIONIC RETICULUM.
- ridges. -- See cell boundaries and FLOAT RIDGE.
- rim. -- See COROLLA, FLOAT and FRILL.
- ring. -- See MICROPYLAR COLLAR.
- ring of pellicle. -- See MICROPYLAR COLLAR.
- scales. -- See OUTER CHORIONIC TUBERCLE.
- sclerotized disc. -- See MICROPYLAR DISC.
- sclerotized lip. -- See MICROPYLAR MOUND.
- sculpture. -- See OUTER CHORIONIC SCULPTURE.
- sculpturing. -- See OUTER CHORIONIC SCULPTURE.
- section. -- See OUTER CHORIONIC CELL.
- shell. -- See CHORION and INNER CHORION.
- shutting up apparatus (aparelho de fechamento). -- See micropylar apparatus.

- small columns (Säulchen). -- See OUTER CHORIONIC TUBERCLE.
- spiculate projections. -- See OUTER CHORIONIC TUBERCLE.
- spiculose projections. -- See OUTER CHORIONIC TUBERCLE.
- spikelets. -- See OUTER CHORIONIC TUBERCLE.
- spine. -- See MICROPYLAR PLUG.
- spine-like processes. -- See OUTER CHORIONIC TUBERCLE.
- spines (espinhos). -- See OUTER CHORIONIC TUBERCLE.
- spots. -- See OUTER CHORIONIC TUBERCLE.
- stippling. -- See OUTER CHORIONIC TUBERCLE.
- stopper. -- See MICROPYLAR PLUG.
- stopping (rolhamento). -- See micropylar apparatus.
- striae. -- See FLOAT RIDGE.
- striated collar. -- See COROLLA.
- striations. -- See FLOAT RIDGE.
- summit. -- See COROLLA.
- supporting ring. -- See MICROPYLAR COLLAR and MICROPYLAR DISC.
- surface ornamentation. -- See OUTER CHORIONIC SCULPTURE.
- surface pattern. -- See INNER CHORIONIC SCULPTURE and OUTER CHORIONIC SCULPTURE.
- surface sculpturing. -- See INNER CHORIONIC SCULPTURE.
- tag. -- In anopheline eggs (Christophers and Barraud 1931, 164) where the frill is incomplete in the middle of the ventral surface, the right and left sides of both its anterior and posterior parts often have a free flap-like terminus, the tag.
- tail end (Schwanzende). -- See POSTERIOR END under ORIENTATION.
- teeth. -- See DENTICLE.
- terminal "bulbs". -- See LOBED TUBERCLE.
- tesselation (Felderung). -- See OUTER CHORIONIC SCULPTURE.
- tip. -- See POSTERIOR END under ORIENTATION.

- transverse ridges. -- See FLANGE.
- trap-door. -- See EGG CAP.
- tubercles. -- See CELLULE and LOBED TUBERCLE.
- tubercles (Tuberkeln). -- See OUTER CHORIONIC TUBERCLE.
- tuberosities. -- See OUTER CHORIONIC TUBERCLE.
- tubes (tubos). -- See FLOAT RIDGE.
- under-surface. -- See DORSAL SURFACE under ORIENTATION.
- under surface. -- See DORSAL SURFACE under ORIENTATION.
- upper end. -- See POSTERIOR END under ORIENTATION.
- upper egg pole (oberer Eipole). -- See ANTERIOR END under ORIENTATION.
- upper face. -- See VENTRAL SURFACE under ORIENTATION.
- upper side (Oberseite). -- See VENTRAL SURFACE under ORIENTATION.
- upper surface. -- See DECK, and DORSAL SURFACE under ORIENTATION.
- upper surface. -- See VENTRAL SURFACE under ORIENTATION.
- upper (ventral) surface. -- See VENTRAL SURFACE under ORIENTATION.
- veined gelatinous veil. -- See FLANGE.
- venter. -- See VENTRAL SURFACE under ORIENTATION.
- ventral side. -- See DORSAL SURFACE under ORIENTATION.
- ventral side (lado ventral). -- See VENTRAL SURFACE under ORIENTATION.
- ventral surface. -- See DORSAL SURFACE under ORIENTATION.
- vertical knobs. -- See OUTER CHORIONIC TUBERCLE.
- vertical pillars. -- See OUTER CHORIONIC TUBERCLE.
- vertical projections. -- See OUTER CHORIONIC TUBERCLE.
- vertical tubercles. -- See OUTER CHORIONIC TUBERCLE.
- vesicles (vesiculas). -- See MICROPYLAR COLLAR and OUTER CHORIONIC TUBERCLE.
- vitelline membrane. -- See INNER CHORION.

walls. -- See cell boundaries.

width (largura). -- See EGG WIDTH.

width of exposed dorsal surface. -- In anopheline eggs (Rozeboom 1938, 98), the distance between the ventral margins of the floats.

width of floats. -- See FLOAT WIDTH.

wings (abas). -- See FRILL.

wings (azelhas). -- See MICROPYLAR COLLAR.

wings (azas). -- See FLOAT.

wrinkles. -- See FLOAT RIDGE.

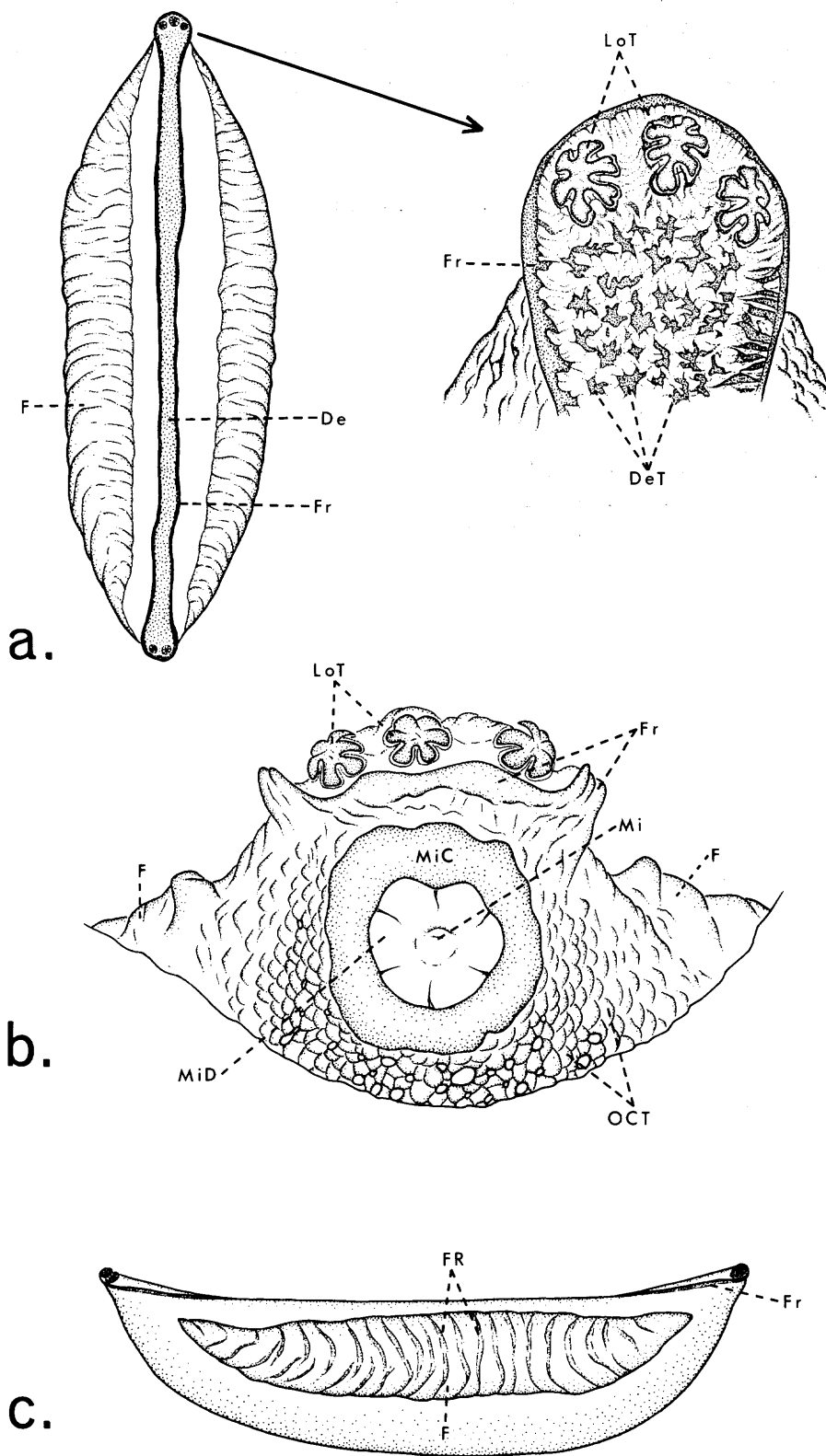
Fig. 82. Egg of *Anopheles (Cellia) aconitus* Dönitz.

- a. Ventral surface (anterior at top).
- b. Anterior end.
- c. Lateral (left) aspect (anterior at right).

Abbreviations

De	=	deck
DeT	=	deck tubercle
F	=	float
Fr	=	frill
FR	=	float ridge
LoT	=	lobed tubercle
Mi	=	(vicinity of) micropyle
MiC	=	micropylar collar
MiD	=	micropylar disc
OCT	=	outer chorionic tubercle

Fig. 82



C. Chang

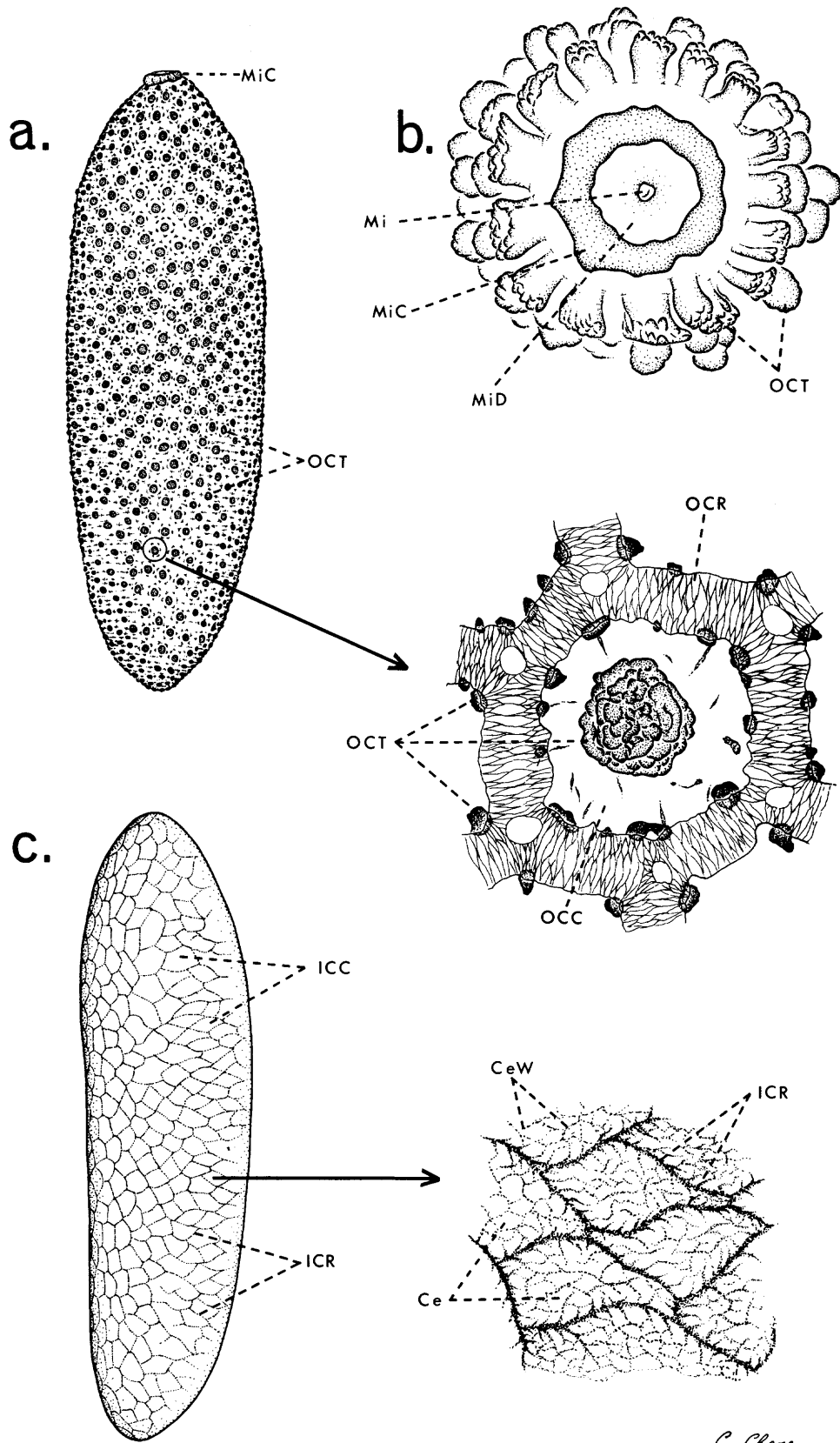
Fig. 83. Egg of *Aedes (Stegomyia) aegypti* (Linnaeus).

- a. Ventral surface (anterior at top) of outer chorion with blow-up showing outer chorionic sculpture.
- b. Anterior end.
- c. Lateral (left) aspect of inner chorion with blow-up of inner chorionic sculpture (anterior at top).

Abbreviations

Ce = cellule
CeW = cellule wall
ICC = inner chorionic cell
ICR = inner chorionic reticulum
Mi = micropyle
MiC = micropylar collar
MiD = micropylar disc
OCC = outer chorionic cell
OCR = outer chorionic reticulum
OCT = outer chorionic tubercle

Fig. 83



C. Chang

Fig. 84a,b. Egg of *Toxorhynchites (Toxorhynchites) brevipalpis* Theobald.

- a. Lateral aspect (anterior at top) with blow-up of outer chorionic sculpture (outer chorionic cell is stippled in total at center-- note absence of outer chorionic reticulum).
- b. Anterior end.

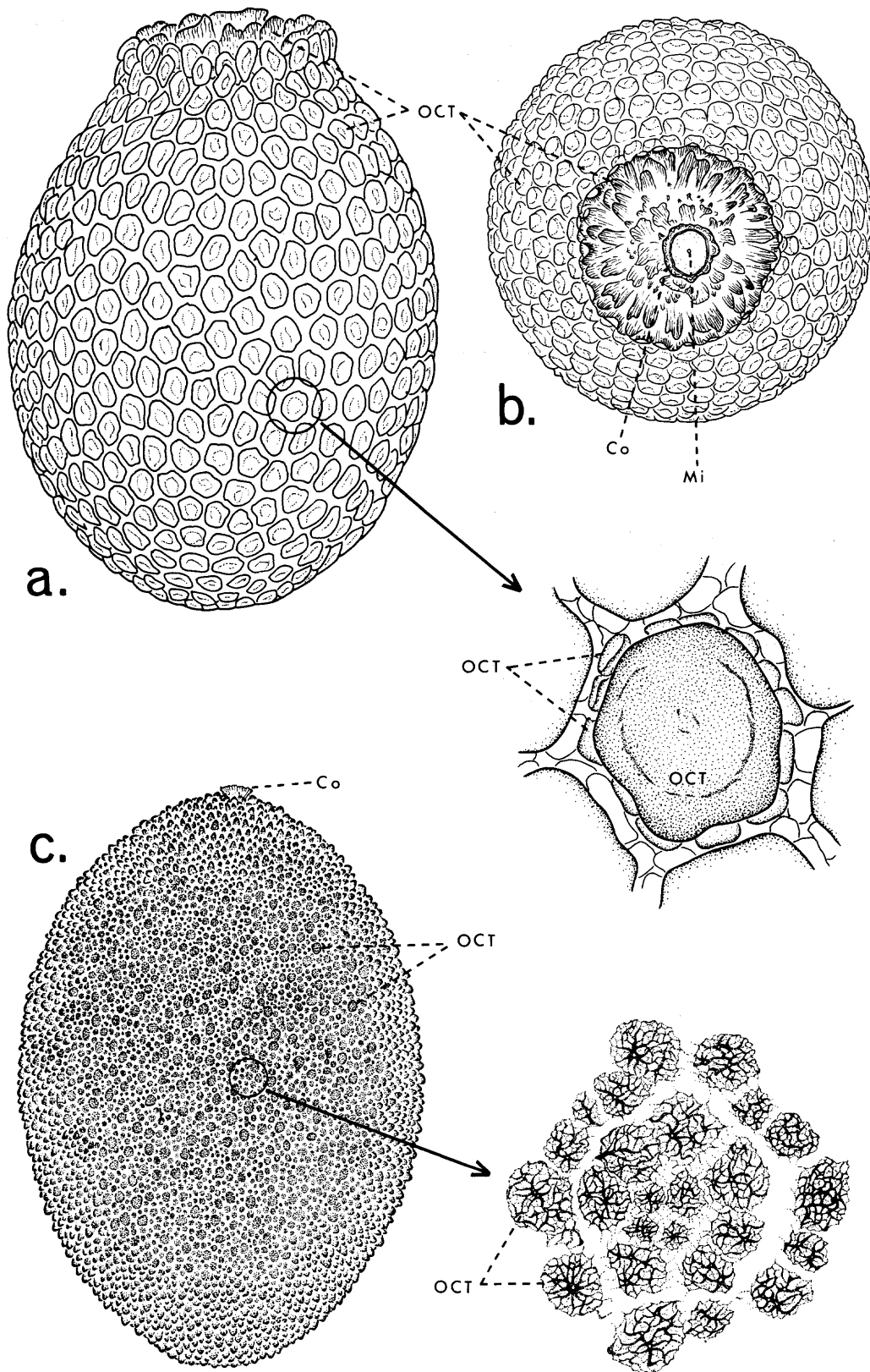
Fig. 84c. Egg of *Toxorhynchites (Toxorhynchites) amboinensis* (Doleschall).

Lateral aspect (anterior at top) with blow-up of outer chorionic sculpture (pentagonal outer chorionic cell is at center -- note absence of outer chorionic reticulum).

Abbreviations

Co = corolla
Mi = micropyle
OCT = outer chorionic tubercle

Fig. 84



C. Cheng

Fig. 85 a-d. Egg of *Aedes (Stegomyia) aegypti* (Linnaeus).

- a. Outer chorionic cell of ventral surface. Scale 6 μm .
- b. Outer chorionic cells of lateral surface. Scale 12 μm .
- c. Anterior end. Scale 12 μm .
- d. Inner chorionic cells and reticulum. Scale 12 μm .

Fig. 85e. Egg of *Anopheles (Cellia) aconitus* Dönitz.

Slightly lateral (right) aspect of posterior end. Scale 15 μm .

Abbreviations

De = deck
Fr = frill
FR = float ridge
ICC = inner chorionic cell
ICR = inner chorionic reticulum
LoT = lobed tubercle
Mi = micropyle
MiC = micropylar collar
MiD = micropylar disc
OCC = outer chorionic cell
OCR = outer chorionic reticulum
OCT = outer chorionic tubercle

Fig. 85

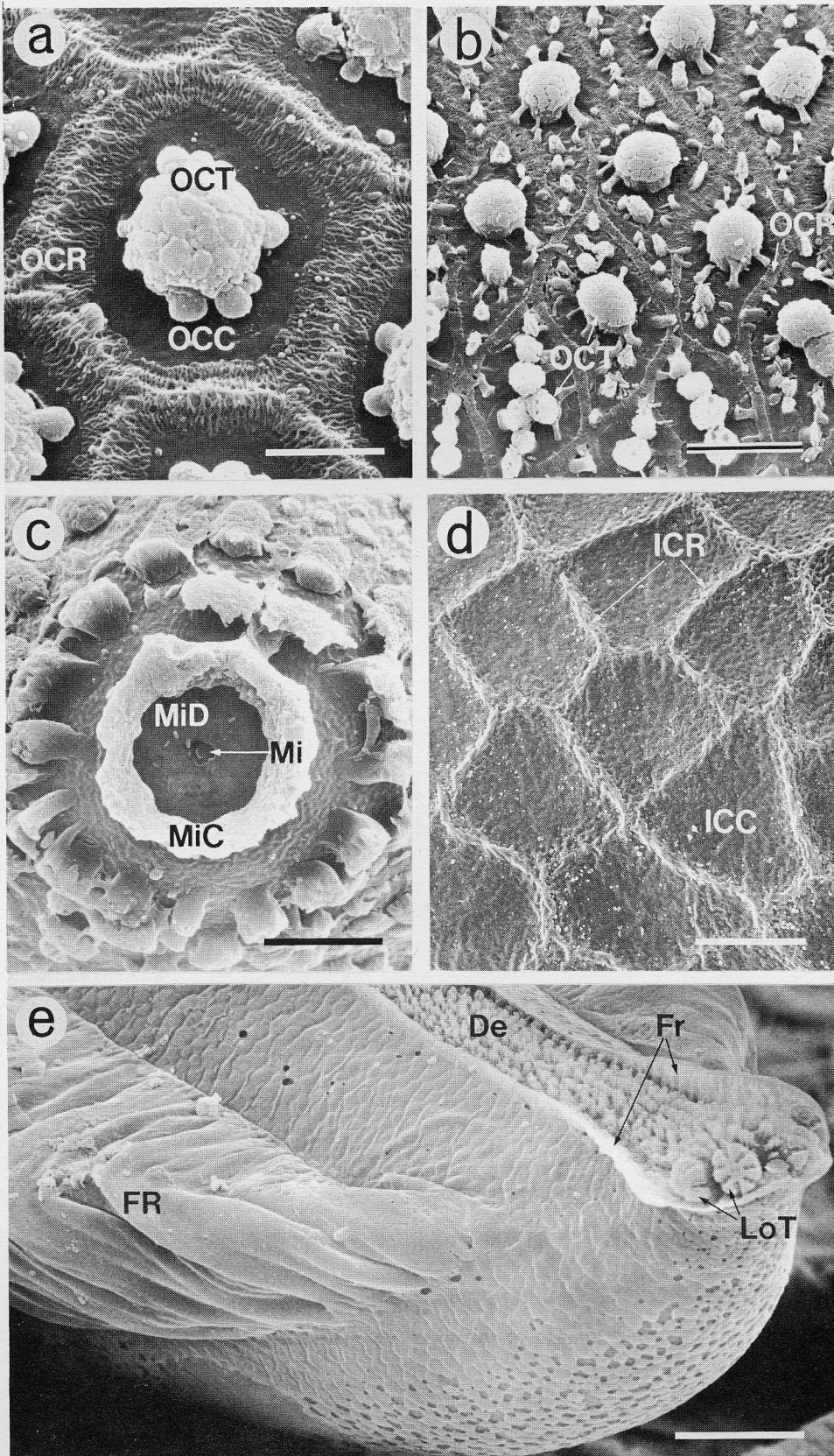


Fig. 86a,b. Egg of *Anopheles (Cellia) Aconitus* Dönitz.

- a. Central area of ventral surface. Scale 15 μ m.
- b. Anterior end. Scale 8 μ m.

Fig. 86c,d. Egg of *Toxorhynchites (Toxorhynchites) brevivalpis* Theobald.

- c. Outer chorionic cell. Scale 6 μ m.
- d. Anterior end. Scale 30 μ m.

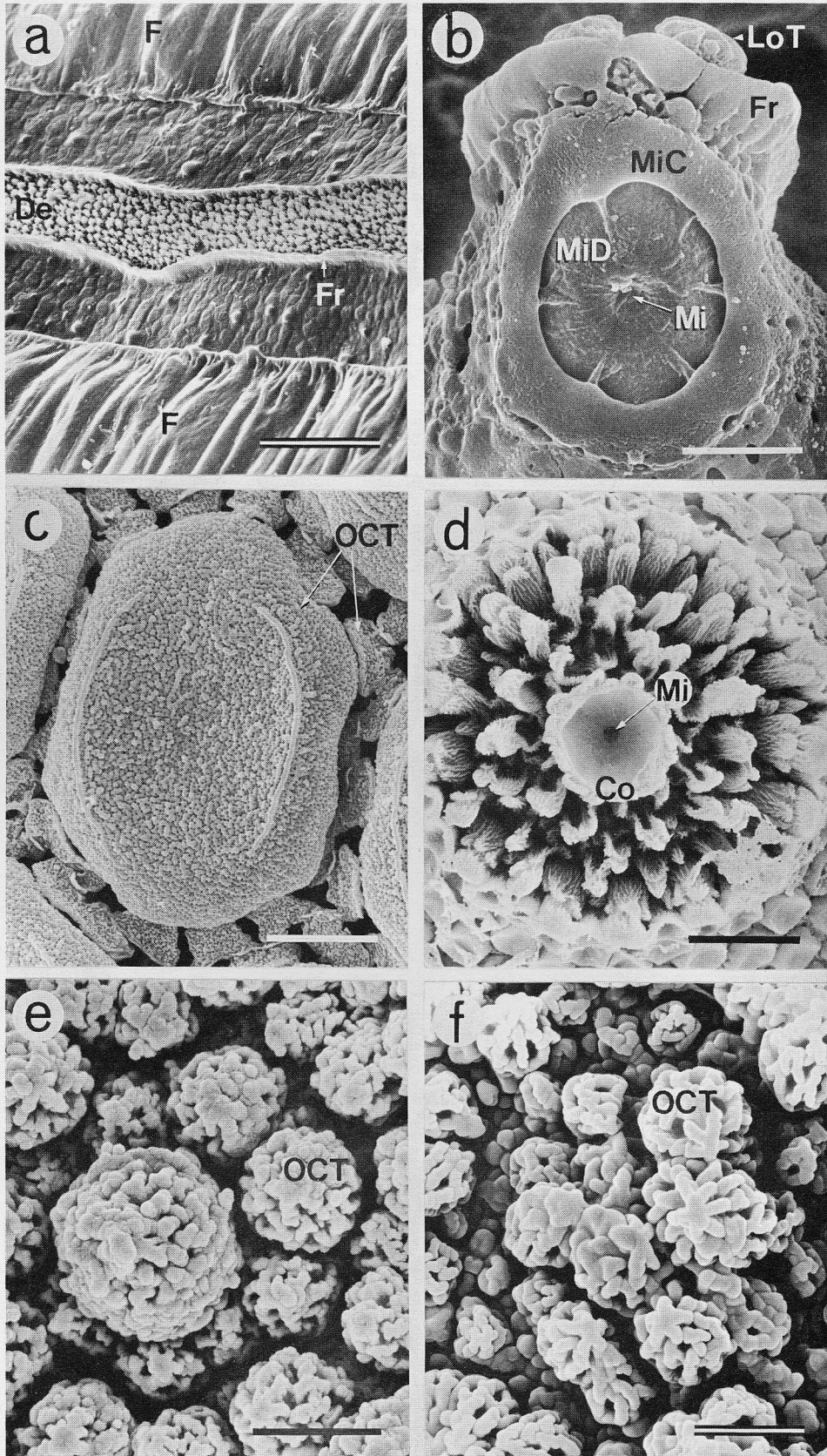
Fig. 86e. Outer chorionic cell (with one large and 7 smaller tubercles) of *Toxorhynchites (Toxorhynchites) amboinensis* (Doleschall). Scale 6 μ m.

Fig. 86 f. Outer chorionic cell (somewhat poorly delimited) of *Toxorhynchites (Lynchiella)rutilus* (Coquillett). Scale 6 μ m.

Abbreviations

Co = corolla
De = deck
F = float
Fr = frill
LoT = lobed tubercle
Mi = micropyle
MiC = micropylar collar
MiD = micropylar disc
OCT = outer chorionic tubercle

Fig. 86



APPENDIX

As previously, this part is appended for the purpose of explaining the introduction of new terms, the recommendation of terms currently not widely accepted for use in the Culicidae, and/or the derivation of terms where appropriate.

CELL. -- The term cell is currently in vogue and has been in use longer than its synonyms. Cells of the outer chorion have usually been recognized as those areas separated by the outer chorionic reticulum whereas the inner chorionic reticulum has usually been thought of as a part of the inner chorionic cells. Since the former concept has existed since the turn of the century (Nuttall and Shipley 1901) and the latter came into being at a much later date (Horsfall *et al.* 1952), we prefer to characterize both INNER and OUTER CHORIONIC CELLS in the older sense.

CHORION. -- Hinton (1968a,b) maintained that there is no strict correspondence between the layers usually called the exo- and endochorion in different insects and referred to the two layers in the mosquito egg as inner and outer layers of the chorion. Since the eggs of many insects have more than two chorionic layers, we agree with Hinton but have adopted the more explicit terms INNER and OUTER CHORION from the works of Mattingly for use in the Culicidae.

The inner chorion is secreted by the follicular epithelium (Nicholson 1921; Harwood and Horsfall 1957; Mathew and Rai 1975) and therefore cannot be regarded as the vitelline membrane (Nath 1924; Beckel 1958; King 1964; Mathew and Rai 1975). The vitelline membrane is defined as the plasma membrane of an ovum (the mature but unfertilized egg cell).

Mathew and Rai (1975, 375) have shown that a thin "lamellate membrane" exists between the inner and outer chorion in the egg of *Aedes aegypti*. Since this layer of the chorion does not appear to be of taxonomic importance at this time, we have not considered it herein.

FLANGE. -- This formation of the *Orthopodomyia* egg is probably homologous with the anopheline frill (Mattingly, pers. corres.). It is so modified, however, that it is worthy of a separate name.

FLOAT RIDGE. -- Among the many synonymous terms applied to this structure of the anopheline float, our selection of an appropriate name came to a choice between float ridge and float rib. We have adopted the former because we feel that it more accurately describes the external appearance of the feature, and because the term ridge has priority over rib.

MICROPYLAR DISC. -- This term was first used by Nath (1924, 158) but only for a portion of the micropylar disc defined herein. Our micropylar disc is equivalent to the "disc" of Nicholson (1921, 409). It should be noted that the "micropylar disc" referred to in the works of Mattingly (1970d, 97 and later papers) denotes a thickened area of outer chorion which is often less than the total area of our micropylar disc.

OUTER CHORIONIC TUBERCLE. -- We have invoked the law of priority in the selection of a term for these structures. They were first referred to as tubercles (=Tuberkeln) by Leuckart (1855, 135) in an aedine egg (Leuckart attributes the egg to *Culex pipiens* but as noted by Bresslau (1920, 244) it is probably an *Aedes* egg.) We have added the modifiers "outer chorionic" to indicate their location, a practice initiated by Mattingly (1970b, 63) who termed the tubercles "outer chorionic papillae." It should be noted that the outer chorionic tubercles occurring on the deck of anopheline eggs have been termed the DECK and LOBED TUBERCLES in keeping with the practice of referring to such structures as tubercles.

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