XVIII.—*Prodromus of a System of the Calcareous Sponges.*

By Ernst Häckel †.

Note.—J. = Johnston. Bb. = Bowerbank. O. S. = Oscar Schmidt. M.-M. = Miklucho-Maclay. H. = Häckel. An * before the name of a genus or species indicates that it is new.

Legion CALCISPONGIÆ, Blainville.

(Synonyms: *Grantiæ*, Fleming; *Spongiæ calcareæ*, Bowerbank.)

Sponges with a skeleton composed of carbonate of lime.

Order I. MONOSYCA, H.

Character. The mature calcareous sponge forms a single person with a single mouth-opening. (Body usually cylindrical, fusiform, or ovate, not branched. Stomachal cavity [inner cavity of the body] simple or chambered, always with a simple mouth-opening placed opposite to the point of adhesion.)

Family I. Prosycida, H.

Character. The mature calcareous sponge forms a simple sac-like person, furnished with a single mouth-opening, the body-wall (stomachal wall) of which is quite solid, and not perforated.

Genus 1. *Prosycum, nov. gen.

Gen. char. Mouth-opening simple, without any peristomial crown (without a circlet of projecting spicules). Two species.

1. **P. simplicissimum*, H. Naples (H.).
2. **P. primordiale*, H. Naples (H.).

Family II. Olynthida, H.

Character. The mature calcareous sponge forms a simple sac-like person furnished with a single mouth-opening, and the body-wall (stomachal wall) of which is perforated only by simple cutaneous pores. (The cutaneous pores are simple interstices in the parenchyma, without any special lining.)

Genus 2. *Olynthus, nov. gen.

Gen. char. Mouth-opening simple, without any peristomial crown (circlet of freely projecting spicules). Five species.

3. **O. simplex*, H. Naples (H.).

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4. *O. guancha*, H. (*Guancha blanca*, M.-M., var. A). Lanzarote (M.-M.).
5. **O. cyathus*, H. Gibraltar (H.).
6. *O. pocillum*, H. (*Sp. pocillum*, Fab.). Greenland (Fab.), Norway.
7. **O. hispidus*, H. Heligoland (H.).

Genus 3. *Olynthium, nov. gen.

Gen. char. Mouth-opening with a peristomial crown (surrounded by a peculiar circlet of freely projecting spicules). Two species.

8. **O. nitidum*, H. Algoa Bay.
9. *O. splendidum*, H. Algoa Bay.

Family III. **Sycarida**, H.

Character. The mature calcareous sponge forms a simple sac-like person furnished with a single mouth-opening, and the stomachal wall of which is permeated by regular radial canals (radial tubes). (The radial tubes are lined with the vibratile entoderm, open at the distal end outwards through cutaneous pores, and at the proximal end through stomachal pores into the stomachal cavity, and communicate with each other on all sides by conjunctive pores.)

Genus 4. *Amphoridium, nov. gen.

Gen. char. Skeleton consisting merely of simple (linear) spicules. One species.

10. *A. viride*, H. (*Ute viridis*, O. S.). Cette (O. S.).

Genus 5. *Amphoriscus, nov. gen.

Gen. char. Skeleton consisting entirely of quadriradiate spicules. Three species.

11. *A. chrysalis*, H. (*Ute chrysalis*, O. S.). Lesina (O. S.).
12. **A. urna*, H. Caraccas (Gollmer).
13. **A. cyathiscus*, H. Australia.

Genus 6. *Sycarium, nov. gen.

Gen. char. Skeleton consisting of triradiate spicules in the walls of the radial canals, of quadriradiate spicules, the fourth ray of which projects freely into the stomachal cavity, in the wall of the stomach, and of simple, freely projecting, linear spicules at the distal ends of the radial canals. Mouth-opening simple, without thinly membranous rostrum or peristomial crown. Six species.

14. **S. ampulla*, H. Norway.
15. **S. rhopalodes*, H. Norway.
16. *S. compressum*, H. (*Grantia compressa*, J., var. A). England; Norway.
17. *S. utriculus*, H. (*Ute utriculus*, O. S., var. A). Greenland.
18. **S. villosum*, H. Antilles.
19. **S. vesica*, H. Messina (H.).

Genus 7. Syconella, O. Schmidt.

Gen. char. Skeleton of *Sycarium*. Mouth-opening produced into a thinly membranous rostrum (a canal not perforated by radial canals), and with no peristomial crown. Three species.

20. *S. quadrangulata*, O. S. Adriatic (O. S.).
21. **S. proboscidea*, H. Red Sea (Siemens).
22. **S. tubulosa*, H. Australia.

Genus 8. Sycum, Risso.

Gen. char. Skeleton of *Sycarium*. Mouth-opening with a simple peristomial crown (surrounded by a simple circlet of freely projecting spicules). Eighteen species.

23. *S. ciliatum*, H. (*Sp. ciliata*, Fabr.). Greenland; British coasts.
24. *S. arcticum*, H. (*S. raphanus*, var., O. S.). Greenland.
25. *S. coronatum*, H. (*Sp. coronata*, Ellis). England, Weymouth (Max Schultze).
26. *S. giganteum*, H. (*Grantia ciliata*, var., J.). Isle of Man; Britain.
27. *S. alopecurus*, H. (*Grantia ciliata*, var., Bb.).
28. *S. tessellatum*, H. (*Grantia tessellata*, Bb.). Channel Islands (Buckland).
29. *S. ananas*, H. (*Sp. ananas*, Montagu). Britain.
30. *S. ovatum*, H. (*S. ciliatum*, Lieberkühn). Heligoland.
31. **S. clavatum*, H. Norway (Schilling).
32. **S. lanceolatum*, H. Norway (Schilling).
33. **S. lingua*, H. Norway (Schilling).
34. *S. tergestinum* (*S. ciliatum*, O. S.). Trieste.
35. *S. raphanus*, O. S. Dalmatia (O. S.).
36. *S. capillosum*, O. S. Sebenico (O. S.).
37. *S. setosum*, O. S. Corfu (O. S.).
38. *S. Humboldtii*, Risso. Nice; Venice.
39. *S. inflatum* (*Sp. inflata*, Delle Chiaje). Naples (D.C.).
40. *S. petiolatum*, O. S. Desterro (Fritz Müller).

Genus 9. Dunstervillia, Bowerbank.

Gen. char. Skeleton of *Sycarium*. Mouth-opening with a double peristomial crown (surrounded by a double circlet of freely projecting spicules, an inner vertical and an outer horizontal one). Five species.

41. *D. elegans*, Bb. Algoa Bay (Bb.).
42. *D. corcyrensis*, O. S. Corfu (O. S.).
43. **D. Schmidtii*, H. Lagosta (O. S.).
44. **D. Lanzerotæ*, H. Lanzarote (M.-M.).
45. **D. formosa*, H. Barbadoes.

Genus 10. Artynas, Gray.

Gen. char. Skeleton as in *Sycarium*. Mouth-opening simple, without either proboscis or peristomial crown. Stomachal cavity chambered, traversed by irregular partitions. Four species.

46. *A. compressus*, H. (*Grantia compressa*, J., var. b). Norway.
47. *A. utriculus*, H. (*Ute utriculus*, O. S., var.). Greenland.
48. **A. rhopalodes*, H. Norway.
49. **A. villosus*, H. Antilles.

Genus 11. Ute, O. Schmidt (*p. p.*).

Gen. char. Skeleton consisting of triradiate spicules in the wall of the radial canals, of quadriradiate spicules, the fourth ray of which projects freely into the stomachal cavity, in the stomachal wall, and of simple linear spicules which lie parallel to the longitudinal axis of the body and, being packed closely together, form a firm external armour round the internal system of radial canals. Mouth-opening simple, without either proboscis or peristomial crown. Two species.

50. *U. glabra*, O. S. Lagosta (O. S.).
51. *U. ensata*, Gray (*Grantia ensata*, Bb.). Guernsey (Buckl.).

Genus 12. *Cyathiscus, nov. gen.

Gen. char. Skeleton consisting of triradiate spicules in the radial partitions of the perigastric chambers, of quadriradiate spicules, the fourth ray of which projects freely into the stomachal cavity, in the wall of the stomach, and of simple linear spicules which run parallel to the longitudinal axis of the body and, being packed closely together, form a firm external armour round the internal system of radial chambers. (The

perigastric radial chambers, which surround the stomach in the same way as in the corals, are probably produced by the deficiency of the horizontal partitions which, in *Sycarium*, *Sycum*, &c., separate the superposed radial canals. Each perigastric chamber opens by a longitudinal series of stomachal pores into the stomachal cavity, and outwardly by several longitudinal rows of cutaneous pores.) Mouth-opening simple, without either proboscis or peristomial crown. One species.

52. **C. actinia*, H. Honolulu (Haltermann).

Family IV. Dyssycida, H.

Character. The mature calcareous sponge forms a simple sac-like person furnished with a single mouth-opening, and the stomachal wall of which is traversed by irregular ramified canals (parietal canals). (The parietal canals communicate repeatedly with each other, and open at the proximal end into the stomach by a few large stomachal pores, and at the distal end, outwardly, by very numerous small cutaneous pores.)

Genus 13. *Dyssycum, nov. gen.

Gen. char. Skeleton consisting of triradiate spicules in the body-wall, of quadriradiate spicules, the fourth ray of which projects freely into the stomachal cavity in the stomachal wall, and of simple, freely projecting spicules at the surface of the body. Mouth-opening simple, without either proboscis or peristomial crown. Five species.

53. *D. fistulosum*, H. (*Grantia fistulosa*, J.). British coasts.
54. *D. penicillatum*, H. (*Sycinula penicillata*, O. S.). Greenland.
55. *D. clavigerum*, H. (*Sycinula clavigera*, O. S.). Greenland (O. S.).
56. *D. solidum*, H. (*Grantia solida*, var. *solitaria*, O. S.). Dalmatia (O. S.).
57. **D. periminum*, H. Perim, Red Sea (Siemens).

Genus 14. *Dyssyconella, nov. gen.

Gen. char. Skeleton as in *Dyssycum*. Mouth-opening produced into a proboscis (a thinly membranous tube not traversed by parietal canals), without a peristomial crown. Two species.

58. *D. pumila*, H. (*Leuconia pumila*, Bb.). Guernsey (Norman).
59. **D. caminus*, H. Antilles.

Genus 15. Sycinula, O. Schmidt.

Gen. char. Skeleton as in *Dyssycum*. Mouth-opening surrounded by a peristomial crown (a simple circlet of freely projecting spicules). Three species.

60. *S. aspera*, O. S. Corfu; Dalmatia (O. S.).
61. *S. Egedii*, O. S. Greenland.
62. **S. echinata*, H. Algoa Bay.

Order II. POLYSYCA, H.

Character. The mature calcareous sponge forms a stock with several mouth-openings. (Body more or less branched, with the branches free or repeatedly united and anastomosed, forming sometimes little shrubs or bushes, sometimes a densely interlaced root-work or a spongy mass. Stomachal cavities of the persons composing the stock communicating with each other directly or indirectly, with a separate mouth-opening at the free end of all or of several branches (persons).)

Family V. Soleniscida, H.

Character. The mature calcareous sponge forms a stock with developed persons, each of which possesses a mouth-opening, and the stomachal walls of which are traversed by simple cutaneous pores, as in the Olynthida.

Genus 16. Leucosolenia, Bowerbank.

Gen. char. Stomachal cavities and their communicating tubes simple, not chambered. Mouth-openings of the persons simple, without either proboscis or peristomial crown. Twenty-one species.

Subgenus 1. *Leucalia.* Spicules all simple (linear). (The outer parts of the spicules project beyond the outer surface.)

63. **L. coralloides*, H., and
64. **L. troglodytes*, H. Naples (H.).

Subgenus 2. *Leucelia.* Spicules all triradiate. (Inner and outer surfaces of the tubes smooth.)

65. **L. dictyoides*, H. Australia.
66. *L. himantia*, H. (*Grantia botryoides*, var. *himantia*, J.). British coasts (J.).
67. *L. complicata*, H. (*Sp. complicata*, Montagu). British coasts (Mont.).
68. *L. guancha*, H. (*Guancha blanca*, var. B, M.-M.) Lanzarote (M.-M.).
69. *L. pulchra*, O. S. Dalmatia (O. S.).

Subgenus 3. *Leucaria.* Spicules partly simple (linear), partly triradiate. (The outer parts of the simple spicules project beyond the outer surface.)

70. **L. thamnoides*, H. Norway.
71. **L. robusta*, H. Naples (H.).
72. *L. Lieberkühnii*, O. S. Triest (O. S.).
73. *L. Fabricii*, O. S. Greenland (O. S.).

Subgenus 4. *Leuceria.* Spicules partly triradiate, partly quadriradiate. (The free ray of the quadriradiate spicules projects into the stomachal cavity.)

74. *L. botryoides*, Bb. (*Sp. botryoides*, Ellis). Britain (Bb.).
75. **L. Grantii*, H. British coasts.
76. **L. Darwinii*, H. British coasts.
77. **L. Goethei*, H. Naples (H.).
78. **L. Lamarckii*, H. Gibraltar (H.).
79. **L. Gegenbauri*, H. Messina (H.).

Subgenus 5. *Leuciria.* Spicules partly simple (linear), partly triradiate, and partly quadriradiate. (The free ray of the quadriradiate projects into the stomachal cavity, and the outer part of the simple spicules beyond the outer surface.)

80. *L. amœboides*, H. (*Grantia botryoides*, Lieberkühn). Heligoland.
81. **L. variabilis*, H. Norway.
82. *L. contorta*, Bb. British coasts (Bb.).

Subgenus 6. *Leucoria.* Spicules partly simple (linear), partly biradiate (hook-shaped), partly triradiate, and partly quadriradiate. (The free ray of the quadriradiate spicules projects into the stomachal cavity; the outer part of the simple and the outer limb of the hook-shaped spicules project beyond the outer surface.)

83. **L. echinoides*, H. Gibraltar (H.).

Genus 17. *Soleniscus, nov. gen.

Gen. char. Stomachal cavities and their communicating tubes chambered, traversed by irregular partitions and divided by them into numerous communicating chambers, in which the embryos are developed (as in *Clathrina*). One species.

84. **S. loculosus*, H. Australia.

Family VI. Tarromida, H.

Character. The mature calcareous sponge forms a stock

with repeatedly interlaced anastomosing branches, and with rudimentary retromorphosed persons, the rudimentary stomachal cavities of which open in groups through common mouth-apertures.

Genus 18. *Tarrus, nov. gen.

Gen. char. Canals internally simple, smooth, with a plain entoderm, without papillæ or internal partitions. Five species.

85. **T. densus*, H. Australia.
86. *T. guancha*, H. (*Guancha blanca*, var. D, M.-M.). Lanzarote (M.-M.).
87. *T. reticulatus*, H. (*Nardoa reticulatum*, var., O. S.). Dalmatia (O. S.).
88. *T. labyrinthus*, H. (*Nardoa labyrinthus*, O. S.). Lesina (O. S.).
89. *T. spongiosus*, H. (*Nardoa spongiosa*, Köll.). Nice (Eberth).

Genus 19. *Tarroma, nov. gen.

Gen. char. Canal-walls internally villous, densely clothed with projecting papillæ (outgrowths of the entoderm). Three species.

90. *T. canariense*, H. (*Nardoa canariensis*, M.-M.). Lanzarote (M.-M.).
91. *T. rubrum*, H. (*Nardoa rubra*, M.-M.). Lanzarote (M.-M.).
92. *T. sulphureum*, H. (*Nardoa sulphurea*, M.-M.). Lanzarote (M.-M.).

Genus 20. Clathrina, Gray.

Gen. char. Canals chambered internally, *i. e.* broken up by irregular partitions (lamellar outgrowths of the entoderm) into numerous intercommunicating chambers, in which the embryos occur. Two species.

93. *C. sulphurea*, Gray (*Grantia clathrus*, O. S.). Sebenico (O. S.).
94. **C. loculosa*, H. Australia.

Family VII. Sycodendrida, H.

Character. The mature calcareous sponge forms a stock with developed persons, each of which possesses a mouth-opening, and of which the stomachal walls are traversed by regular radial canals (radial tubes), as in the Sycarida.

Genus 21. *Sycidium, nov. gen.

Gen. char. Mouth-openings simple, without proboscis and without peristomial crown. Stomachal cavities of the persons simple, not chambered. Skeleton as in *Sycarium*. Two species.

95. *S. gelatinosum*, H. (*Alcyoncellum gelatinosum*, Blainv.). Habitat? (Quoy & Gaimard).

96. **S. compressum*, H. (*Grantia compressa*, J., var. c). British coasts; Norway.

Genus 22. *Sycodendrum, nov. gen.

Gen. char. Mouth-openings without proboscis, with a peristomial crown (surrounded by a circlet of freely projecting spicules). Stomachal cavities of the persons simple, not chambered. Two species.

97. **S. ramosum*, H. Heligoland (H.).

98. **S. procumbens*, H. Australia.

Genus 23. *Artynium, nov. gen.

Gen. char. Mouth-openings simple, without proboscis or peristomial crown. Stomachal cavities of the persons chambered, traversed by irregular partitions. Skeleton as in *Sycarium*. One species.

99. *A. compressum*, Gray (*Grantia compressa*, J., var. b). Norway.

Genus 24. Apiroceras, Gray.

Gen. char. Mouth-openings simple, without proboscis and without peristomial crown. Stomachal cavities of the persons chambered, traversed by irregular partitions. Skeleton consisting of simple fusiform spicules, which run parallel to the longitudinal axes of the persons and of the branched stem, and, being closely packed together, form a firm external armour round the internal system of radial canals (?). One species.

100. *A. alcicornis*, Gray. Hong Kong (Harland).

Family VIII. **Sycothamnida.**

Genus 25. *Sycothamnus, nov. gen.

Gen. char. Persons of the stock separated, only connected by their peduncles. Mouth-openings simple, without proboscis or peristomial crown. One species.

101. **S. fruticosus*, H. Red Sea (Siemens).

Genus 26. Leuconia, Grant.

Gen. char. Persons of the stock united by the greater part of their body-wall; only their stomachal cavities and mouth-openings separated. Mouth-openings simple, without proboscis or peristomial crown. Five species.

102. *L. nivea*, Bb. (*Sp. nivea*, Grant). British coasts.
103. *L. Gossei*, O. S. (*Leucogypsia Gossei*, Bb.). Channel Islands.
104. *L. stilifera*, O. S. Greenland.
105. *L. algoensis*, H. (*Leucogypsia algoensis*, Bb.). Algoa Bay.
106. *L. solida*, O. S. (*Grantia solida*, var. *socialis*, O. S.). Dalmatia (O. S.).

Order III. **CŒNOSYCA**, H.

Character. The mature calcareous sponge forms a cœnobium (a stock composed of several persons with a single common mouth-opening). Body branched, with its branches everywhere coalescent and anastomosing, and finally running together into a single mouth-opening. (Rarely the persons also grow together externally to form a massy lump, as in *Cœnostomella*.)

Family IX. **Nardopsida**, H.

Character. The mature calcareous sponge forms a stock with a single mouth-opening, the canal-walls of which are only traversed by simple cutaneous pores (as in the Olynthida and Soleniscida).

Genus 27. Nardoa, O. S.

Gen. char. Mouth-opening simple, not produced into a thinly membranous proboscis. Two species.

107. *N. guancha*, H. (*Guancha blanca*, var. c, M.-M.). Lanzarote, (M.-M.).
108. *N. lacunosa*, O. S. (*Grantia lacunosa*, J.). British coasts.

Genus 28. *Nardopsis, nov. gen.

Gen. char. Mouth-opening produced into a long thinly membranous proboscis. Two species.

109. **N. gracilis*, H. Australia.
110. *N. reticulum*, O. S. (*Nardoa reticulum*, O. S.). Dalmatia, O. S.)

Family X. **Cœnostomida**, H.

Character. The mature calcareous sponge forms a stock with a single mouth-opening, the stomachal walls of which are traversed by irregularly branched canals.

Genus 29. *Cœnostomella, nov. gen.

Gen. char. The persons of the stock are united into a single mass, the common mouth-opening of which is produced into a thinly membranous proboscis, whilst the stomachal cavities of the persons remain separated. One species.

111. **C. caminus*, H. Antilles.

Order IV. **CLISTOSYCA**, H.

Character. The mature calcareous sponge forms one person without a mouth-opening. (The body usually appears under the form of an ovate, spheroidal, or compressed bladder, the internal cavity of which communicates with the surrounding water only by cutaneous pores or parietal canals, but by no large orifice (mouth); the mouth is closed up.)

Family XI. **Clistolynthida**, H.

Character. The mature calcareous sponge forms a person without a mouth-opening, the wall of which is traversed by simple cutaneous pores (as in the Olynthida).

Genus 30. *Clistolynthus, nov. gen.

Gen. char. Stomachal cavity simple, without partitions. One species.

112. **C. vesicula*, H. Honolulu (Haltermann).

Family XII. **Sycocystida**.

Character. The mature calcareous sponge forms one person without a mouth-opening, the body-wall of which is traversed by regular radial canals (radial tubes) as in the Sycarida.

Genus 31. *Sycocystis, nov. gen.

Gen. char. Stomachal cavity quite simple, without compartments. Three species.

113. **S. oviformis*, H. Heligoland (H.).
114. **S. compressa*, H. Norway.
115. *S. utriculus*, H. (*Ute utriculus*, O. S.). Greenland.

Genus 32. *Artynella, nov. gen.

Gen. char. Stomachal cavity chambered, traversed by irregular partitions. Three species.

116. **A. compressa*, H. Norway.
117. **A. rhopalodes*, H. Norway.
118. *A. utriculus*, H. (*Ute utriculus*, var., O. S.). Greenland.

Family XIII. **Lipostomida**, H.

Character. The mature calcareous sponge forms one person without a mouth-opening, the body-wall of which is traversed by irregular branched canals (as in the Dyssycida).

Genus 33. *Lipostomella, nov. gen.

Gen. char. Stomachal cavity quite simple, without compartments. Two species.

119. **L. clausa*, H. Mogador (H.).
120. **L. capsula*, H. Algoa Bay (Poehl).

Order V. **COPHOSYCA**, H.

Character. The mature calcareous sponge forms a stock without a mouth-opening. (The body appears under the form either of a branching shrub or of a root-like network, in consequence of partial ramification, or, lastly, of a shapeless mass formed by the complete amalgamation of several persons. The stomachal cavities of the persons are always more or less separated, whilst their mouth-openings are obliterated.)

Family XIV. **Sycorrhizida**, H.

Character. The mature calcareous sponge forms a stock without mouth-openings, the canal-walls of which are traversed by simple cutaneous pores.

Genus 34. *Sycorrhiza, nov. gen.

Gen. char. The mouthless stock forms a root-like network composed of communicating tubes, the inner wall of which is smooth (not villous), and their cavity simple (not chambered). Two species.

121. **S. coriacea*, H. (*Leucosolenia coriacea*, Bb.). British coasts.
122. **S. corallorrhiza*, H. Norway.

Genus 35. *Aulorrhiza, nov. gen.

Gen. char. The mouthless stock forms a root-like network

composed of communicating tubes, the inner wall of which is villous (set with papillæ), and their cavity simple (not chambered). One species.

123. **A. intestinalis*, H. Mogador (H.).

Genus 36. *Auloplegma, nov. gen.

Gen. char. The mouthless stock forms a root-like network, the ramifications of which are communicating tubes with a chambered cavity traversed by irregular partitions (outgrowths of the entoderm). One species.

124. **A. loculosum*, H. Australia.

Family XV. **Sycophyllida**, H.

Character. The mature calcareous sponge forms a stock without mouth-opening, the stomachal walls of which are traversed by regular radial canals (radial tubes) as in the Sycodendrida.

Genus 37. *Sycophyllum, nov. gen.

Gen. char. Stomachal cavities simple, not chambered. Two species.

125. **S. lobatum*, H. Norway.
126. **S. compressum*, H. Norway.

Genus 38. *Artynophyllum, nov. gen.

Gen. char. Stomachal cavities chambered, traversed by irregular partitions. One species.

127. **A. compressum*, H. Norway (H.).

Family XVI. **Sycolepida**, H.

Character. The mature calcareous sponge forms a stock without mouth-opening, the stomachal walls of which are traversed by irregular, ramified parietal canals (as in the Dyssycida).

Genus 39. *Sycolepis, nov. gen.

Gen. char. The stock forms an expanded crust or a shapeless lump, in the parenchyma of which the simple (not chambered) stomachal cavities of the persons are scattered, only connected by the branched parietal canals and only opening outwards by the cutaneous pores. Two species.

128. **S. incrustans*, H. Norway (Schilling).
129. **S. pulvinar*, H. Indian Ocean (Schneehagen).

Order VI. METROSYCA, H.

Character. The mature calcareous sponge forms a stock, the constituent (mature) persons or groups of persons of which exhibit the forms of different genera and even of different families of the Calcispongiæ. (Notwithstanding that the persons united upon one cormus are mature (*i. e.* contain spores or embryos), and therefore capable of propagation, they present such diverse forms that, if isolated, we should regard them as belonging not merely to different species, but even to different genera and families.)

Family XVII. Thecometrida, H.

Character. The mature calcareous sponge forms a stock, the constituent persons of which represent the forms of different genera, whilst their canal-walls are traversed by simple cutaneous pores (as in the Soleniscida).

Genus 40. Guancha, M.-M.

Gen. char. Canals of the stock simple, neither villous nor chambered internally. One species.

130. *G. blanca*, M.-M. Lanzarote (M.-M.). (The stock in its most highly developed form bears united forms of four genera, namely:—1, *Olynthus*; 2, *Leucosolenia*; 3, *Turrus*; 4, *Nardoa*.)

Genus 41. *Thecometra, nov. gen.

Gen. char. Canals of the stock chambered, internally traversed by irregular partitions. One species.

131. **T. loculosa*, H. Australia. (The stock in its most highly developed form bears united forms belonging to three genera, namely:—1, *Soleniscus*; 2, *Clathrina*; 3, *Auloplegma*.)

Family XVIII. Sycometrida, H.

Character. The mature calcareous sponge forms a stock, the constituent persons of which represent the forms of different genera, whilst their canal-walls are traversed by regular radial canals (radial tubes), as in the Sycodendrida.

Genus 42. *Sycometra, nov. gen.

Gen. char. Mouth-openings of the persons simple, without proboscis or peristomial crown. Skeleton as in *Sycarium*. One species.

132. **S. compressa*, H. Norway. (The stock, in its most highly developed form, bears united forms of eight genera, namely:—1, *Sycarium*; 2, *Artynas*; 3, *Sycidium*; 4, *Astynium*; 5, *Sycocystis*; 6, *Artynella*; 7, *Sycophyllum*; 8, *Artynophyllum*.)

Synoptical Table of the Families of Calcispongiæ, *with especial reference to the conditions of individuality.*

I. **Monosyca.** Calcareous sponge one person with one mouth-opening.	Stomach-wall solid, without cutaneous pores and without parietal canals...	1.	*Prosycida.*
	with simple cutaneous pores ...	2.	*Olynthida.*
	with regular, radial parietal canals	3.	*Sycarida.*
	with irregular, branched parietal canals	4.	*Dyssycida.*
II. **Polysyca.** Calcareous sponge a stock with many mouth-openings.	with simple cutaneous pores (stock with developed persons)	5.	*Soleniscida.*
	with simple cutaneous pores (stock with rudimentary persons)	6.	*Tarromida.*
	with regular, radial parietal canals	7.	*Sycodendrida.*
	with irregular, branched parietal canals	8.	*Sycothamnida.*
III. **Cœnosyca.** Calcareous sponge a stock with one mouth-opening.	with simple, cutaneous pores ...	9.	*Nardopsida.*
	with irregular, branched parietal canals	10.	*Cœnostomida.*
IV. **Clistosyca.** Calcareous sponge one person without a mouth-opening.	with simple cutaneous pores ...	11.	*Clistolynthida.*
	with regular, radial parietal canals	12.	*Sycocystida.*
	with irregular, branched parietal canals	13.	*Lipostomida.*
V. **Cophosyca.** Calcareous sponge a stock without mouth-opening.	with simple cutaneous pores ...	14.	*Sycorrhizida.*
	with regular, radial parietal canals	15.	*Sycophyllida.*
	with irregular, branched parietal canals	16.	*Sycolepida.*
VI. **Metrosyca.** Calcareous sponge a stock composed of persons and stocks of various species and genera.	with simple cutaneous pores ...	17.	*Thecometrida.*
	with regular, radial parietal canals	18.	*Sycometrida.*

Synoptical Table of the Families of Calcispongiæ, *with especial reference to the conditions of canalization.*

I. **Aporeuta.** Stomach-wall solid, without cutaneous pores or parietal canals.	One person with one mouth-opening	1.	*Prosycida.*

II. **Microporeuta.** Stomach-wall with simple cutaneous pores (interstices in the parenchyma), without parietal canals.	One person with one mouth-opening		2. *Olynthida.*
	A stock with many mouth-openings.	Persons developed, all with mouth-openings	5. *Soleniscida.*
		Persons rudimentary, many without mouth-opening	6. *Tarromida.*
	A stock with one mouth-opening		9. *Nardopsida.*
	A person without mouth-opening		11. *Clistolynthida.*
	A stock without mouth-opening		14. *Sycorrhizida.*
	A stock composed of persons and stocks of diverse genera		17. *Thecometrida.*
III. **Orthoporeuta.** Stomach-wall with straight, regular, radial parietal canals.	One person with one mouth-opening		3. *Sycarida.*
	A stock with many mouth-openings		7. *Sycodendrida.*
	A person without a mouth-opening		12. *Sycocystida.*
	A stock without mouth-openings		15. *Sycophyllida.*
	A stock composed of persons and stocks of different genera		18. *Sycometrida.*
IV. **Cladoporeuta.** Stomach-wall with crooked, irregular, branched parietal canals.	One person with one mouth-opening		4. *Dyssycida.*
	A stock with many mouth-openings		8. *Sycothamnida.*
	A stock with one mouth-opening		10. *Cœnostomida.*
	One person without mouth-opening		13. *Lipostomida.*
	A stock without mouth-openings		16. *Sycolepida.*

XIX.—*On the Parasitism of* Rhipiphorus paradoxus.

By T. Algernon Chapman, M.D.

I have read Mr. Murray's papers on the economy of *Rhipiphorus* with much interest; and although he has not succeeded in converting me to his views of its life-history, he has added to our knowledge of its habits and raised anew an interest in the relations subsisting between the wasps and their parasites which will probably lead to observations in the coming season that will set at rest many of the points in dispute.

In the meantime I think it very desirable to form as correct an hypothesis of the life of *Rhipiphorus* as our facts admit of, since an approximation to the truth is a most valuable guide in making further investigations, while, on the contrary, an erroneous theory may blind us to very obvious truths.

I cannot better begin the remarks I desire to make than by rendering what appears to me to be but justice to the accuracy of the earliest record we have of the economy of *Rhipiphorus*, meagre and deficient in detail though this record is. The observations of Mr. Denison, brought to our notice by Mr. Smith from the papers of the Ashmolean Society, appear to me to