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connexion with the auricle, and likewise with the efferent vessels from the papillæ; *e*, portal heart lying under the pericardium and opening through its floor; *f*, efferent vessels from the branchial papillæ.

Fig. 4. Central ganglions and their nerves:—*a, a*, cerebroid ganglions; *b, b*, branchial ditto; *c, c*, pedial ditto; *d, d*, olfactory ditto; *e, e*, buccal ditto; *f, f*, gastro-cesophageal ditto; *g*, nervous cord, connecting the infra-cesophageal to the supra-cesophageal ganglions, forming the anterior collar; *h*, small middle collar; *i*, great cesophageal collar; 1st pair of nerves go to the dorsal tentacles; 2nd pair to the upper portion of the channel of the mouth and lips; 3rd and 4th pairs go likewise to the channel of the mouth and lips; 5th pair supply the skin at the side of the head; 6th and 7th pairs pass to the skin at the side of the back, and supply the branchial papillæ; 8th and 9th pairs go to the foot; 10th pair are the lingual nerves; 11th pair supply the muscles of the buccal mass; 12th pair supply the gullet and stomach; 13th pair go to the glands of the papillæ; 14th is a single nerve going to the reproductive organs; 15th is likewise a single nerve, and probably also goes to the same organs.

Fig. 5. Interior view of one of the jaws:—*a*, cutting edge; *b*, point at which the two jaws are articulated; *c*, expanded lobe at the dorsal margin for muscular attachment.

Fig. 6. External view of the same:—*a*, cutting edge; *b*, expanded lobe at the dorsal margin.

Fig. 7. Two of the spinous plates from the tongue.

Fig. 8. Transverse section of a branchial papilla:—*a*, gland; *b*, afferent branchio-cardiac vessel; *c*, efferent ditto.

XXIV.—*On Chantransia, Desv.* By JOHN RALFS, Esq.*

CHANTRANSIA, Desv. TRENTEOPLIA, Agardh and British authors.

Plant affixed, tufted; filaments branched, jointed, monosiphonous; fructification—capsules with granular contents and usually terminal and subcorymbose on proper branches.

Freshwater, minute, tufted Algæ of a red, purplish or inky colour. Filaments much branched, jointed; main branches elongated, mostly level-topped. Fructification capsular, usually on short, much divided proper branches; capsules generally crowded, subcorymbose, and terminal on short stalks, their contents simple.

The proper position of this genus is doubtful: in habit and appearance some of its species agree so closely with the minute, parasitic, irregularly branched species of *Callithamnion*, that Dr. Harvey in his 'Flora Hibernica' united it to that genus; and although, at Mrs. Griffiths' suggestion, he has, in his 'Manual of

* Read before the Botanical Society of Edinburgh, June 19, 1851.

British Algæ,' again separated them, yet he justly remarks, that deep-coloured specimens of *Trentepohlia pulchella* (*Chantransia Hermannii*) so much resemble *Callithamnion Daviesii* as scarcely to be distinguishable from it.

Whilst, however, the red colour of some species of *Chantransia* seems thus to indicate an affinity with the *Rhodospirææ*, the inky-green of others appears to forbid us to rank the genus in that order. Dr. Montagne, a high authority, places it in *Ectocarpeæ*, a tribe belonging to the *Melanospermeæ*, and Kützing refers it to the *Confervææ*. *Chantransia* has thus been associated by authors of distinguished merit with the three great primary divisions of the Algæ,—a proof how difficult it is to ascertain its proper position. As the contents of its capsules are simple and not divided into tetraspores, I believe its correct situation is with the *Chlorospirææ*.

1. *C. Hermannii* (Roth). Tufts dense, reddish; joints of filaments three to five times longer than broad; fructiferous ramuli patent, capsules crowded. *Conferva Hermannii*, Roth, Cat. i. p. 164 (1797); Cat. iii. p. 180. *Conferva nana*, Dillwyn, Conf. t. 30 (1803); Smith, Eng. Bot. t. 2585. *Chantransia Hermannii*, Desv. (?); Kützing, Phycologia Germanica, p. 230. *Trentepohlia pulchella*, Agardh, Systema Alg. p. 37 (1824); Harvey in Hooker's Brit. Flora, p. 382; Manual of Brit. Algæ, p. 75; Hassall, Brit. Algæ, p. 75. t. 8. f. 2. *Auduinella Hermannii*, Duby, Botanicon Gallicum, p. 972 (1830).

On aquatic plants in streams.

The tufts of *Chantransia Hermannii* are dense, soft and woolly, not gelatinous, and adhere but imperfectly to paper; they are often confluent; their colour is reddish, becoming tawny by age and in drying. Filaments much branched, main branches elongated, somewhat level-topped; fructiferous branches lateral, numerous, short, patent, much divided. Capsules at first oval or clavate, finally orbicular, crowded in a corymbose manner, mostly stalked. Joints of stem three to five times as long as broad, those of fertile branches shorter.

Chantransia Hermannii differs from *C. chalybea* in colour and in its shorter joints and more patent ramuli.

2. *C. investiens* (Lenormand). Parasitic, rose-red, much branched; joints many times longer than broad; capsules solitary or in pairs, lateral and terminal, clavate or obovate. *Batrachospermum rubrum*, Hassall, Brit. Algæ, p. 113. t. 15. f. 2, 3 (1845). *Chantransia investiens*, Lenormand in Kützing's Species Algarum, p. 431 (1849); Ralfs, British Alg. no. 12.

Parasitic on *Batrachospermum moniliforme* and *B. atrum* in a stream, Penzance, J. R.

France, Lenormand!

Plant bright red, at first appearing as minute reddish stains, finally clothing the invested plant with a continuous downy covering. Filaments creeping and interlacing at base, and surrounding the plant on which it grows, much branched. Branches not attenuated, alternate, erect, elongated; joints very long, often twelve times as long as broad, and filled with a pink, slightly granular endochrome. Capsules clavate or obovate, alternate or opposite, sometimes, though rarely, opposite a branch; the terminal ones are more orbicular.

3. *C. chalybea* (Roth). Tufts rather lax, inky-green; joints of filaments five to six times longer than broad, those of fructiferous ramuli turgid; branches appressed. *Conferva chalybea*, Roth, Cat. iii. p. 286. t. 8. f. 2 (1806); Dillwyn, Brit. Conf. t. 91. *Conferva corymbifera*, Smith, E. Bot. t. 1996 (1809). *Ectocarpus chalybeus*, Lyngbye, Tent. Hydrophytologiæ Danicæ, p. 133. t. 44 (1819); Fl. Dan. t. 1666. fig. 1. *Trentepohlia pulchella*, β . *chalybea*, Agardh, System. p. 37 (1824); Harvey, Manual of Brit. Algæ, p. 118. *Auduinella chalybea*, Bory, Dict. cl. iii. p. 340. *Chantransia chalybea*, Fries; Kützinger, Phyc. Germ. p. 229; Species Algarum, p. 429; Ralfs, British Algæ, no. 11.

β . *major*. Filaments longer with rather shorter joints, ramuli more distant.

a. Common. Rivulets, waterfalls, and on water-wheels.

β . Wells, Penzance, *J. R.*

Plant laxly tufted, of an inky colour, more or less tinged with green. Branches rather distant, level-topped, erect, their joints four to six times longer than broad. Fertile branches short, appressed, their joints shorter and usually turgid. Capsules orbicular, corymbose, less crowded than in *Chantransia Hermannii*.

Chantransia chalybea differs from *C. Hermannii* in its colour, penicillate tufts and its appressed fructiferous branches, the joints of which are more turgid. The dried plant is usually more or less glossy.

4. *C. compacta* (—). Plant minute, hemispherical, inky-green, firm; filaments much branched, joints twice as long as broad; branches erecto-patent.

On aquatic plants in a rivulet at Trengwainton near Penzance, *J. R.*

Chantransia compacta forms very minute hemispherical tufts or fronds of a dark colour, and very much resembles a *Rivularia* in appearance; the fronds are so firm as to require considerable pressure in order to separate the filaments for microscopic examination. Filaments comparatively stout, rigid, much branched, at the base horizontal and interlacing. Branches crowded, erecto-

patent. Joints about twice as long as broad, but the lower ones frequently shorter. Capsules orbicular, numerous, lateral, arising from all parts of the plant and usually on short stalks.

Chantransia compacta differs from *C. chalybea* in its compact, firm habit, more crowded branches, shorter joints and more scattered capsules.

I am unacquainted with *C. violacea*, Kütz., and am consequently unable to decide with certainty that this plant is not a variety of that species; but its difference in colour has induced me to propose it as a distinct species.

Kützing in his 'Species Algarum' mentions two other British species: as I am unacquainted with them, I subjoin his descriptions:—

5. *C. scotica* (Kütz.). Cæspite cæruleo-chalybeo, majori, trichomatibus $\frac{1}{340}$ ''' crassis, ramis ramulisque remotis patentibus elongatis; articulis diametro plerumque duplo longioribus. Kützing, *Phyc. Gener.* p. 285; *Species Alg.* p. 430.

In Scotia legit cl. Klotzsch.

6. *C. violacea* (Kütz.). Cæspite minuto, violaceo, subgloboso; trichomatibus radiatim dispositis, rigidis, ramulis crebris approximatis, abbreviatis, patentibus, subsecundis; articulis inferioribus diametro fere æqualibus superioribus 2-3plo longioribus. Kützing, *Phyc. Germ.* p. 231; *Species Alg.* p. 431.

In fluviis et rivulis montanis Germaniæ et Scotiæ ad *Lemaniam fluviatilem*.

XXV.—*A List of all the Mosses and Hepaticæ hitherto observed in Sussex.* By WILLIAM MITTEN, A.L.S.

BESIDES the species not before described as British, this list will be found to contain localities for others of rare occurrence or but little known, and will show the comparative rarity of the more common species.

With very few exceptions all the species enumerated have been gathered by the author himself; most of the previously known rarer species having been shown to him in their respective localities by Mr. Borrer, with whom he has examined many of the most productive parts of the county, and to access to whose collections he attributes chiefly whatever small amount of critical knowledge he may possess of these beautiful plants.

Tribe I. ANDREÆACEÆ.

Genus 1. *Andreaea*, Ehrh.

A. rupestris, Hedw.

"On the High Rocks;" Forster, Fl. Tonbridgensis.

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