the movements of the animal. Macartney saw it increased in the Medusa lucida when he warmed the water. The light also became more vivid in alcohol ; the animals, how­ever, quickly perished in it, and their light was extinguish­ed. Spallanzani remarked the trickling of a viscous fluid from the surface of Medusæ, which had a burning taste, and produced an itching sensation on the skin. This li­quid, mixed with water or milk, renders them phosphores­cent for some hours, particularly when they are warmed and agitated. Dead animals, whose light was extinguished, again became phosphorescent by the addition of a quantity of spring water, and by movement at a heat of 26° to 37°. Humboldt observed his fingers to shine for some time after he had touched Medusæ: he also saw the light become stronger when the animals were galvanized. The light of Medusæ to which Macartney applied an electric shock, was extinguished for an instant, but afterwards appeared more vividly than previously."@@1 In reference to the immediate cause of the phenomenon, the opinions which have been divulged are numerous and contradictory : here it must suffice to give Tiedemann’s, as the most probable. “ Weigh­ing well all the circumstances,” says he, “ phosphorescence would seem to depend on a matter, the product of the changes of composition accompanying life, and, to all ap­pearance, secreted from the mass of humours by particular organs. This liquid probably contains phosphorus, or an analogous combustible substance, which combines with the oxygen of the air, or of aerated water, at a medium tem­perature, and thus produces the disengagement of light. The preparation and secretion of this substance are acts of life, which change, augment, or decrease by the influence of external stimulants, whose action on the animals modi­fies their manifestations of life. But the phosphorescence itself depends on the composition of the secreted matter, and cannot be regarded as a vital act, because on certain occasions it continues for whole days, even after the death of the animal.”@@® As for its use, opinions are equally various ; but perhaps we err least when we conjecture it may serve to pro­tect those gifted with it from the aggressions of their enemies.

Many Medusides possess likewise a stinging property sufficiently strong to blister the skin and inflict acute suffer­ing.@@3 Bosc describes the consequences thus. When a venomous Medusa touches the skin, there results a consider­able redness, with buttons of the same hue, which have a little white spot in their centres, attended with a piercing pain, which, after it has somewhat subsided, may be com­pared to often-repeated pricks. This lasts generally a half hour, and may be appeased by the application of linen steeped in oil, or even in fresh water. The redness will often re-appear after the lapse of several days, when the part is exposed to a temperature higher than that of the atmosphere.@@4 He imagined that it was occasioned by the application of numerous microscopical suctorial papillæ, which issue from the surface of the tentacular arms, to the skin ; but this is disproved by the fact of the dead ani­mal being not less vesicatory than the one yet living. It probably resides, as Dicquemare believed, in some caustic exudation of the exterior membranes ; but it is not identical with the phosphorescent secretion, for some vesicating Me­dusæ are not luminous, and we know from our own ex­perience that our native luminous species are not all endowed with the power of vesication.

The distinction of the species is difficult, because of the changes which they suffer in their growth ; and the difficulty is increased by their frequent minuteness and transparency, which render them scarcely visible in the water ; by their soft fragility and ten­dency to dissolution, which prevents them being handled without injury, and opposes an almost insurmountable obstacle to their preservation in museums. From these inherent difficulties, the classification of the Medusides is believed to be still in an imper­fect and artificial state ; yet a comparison between its Linnæan barrenness, when one small genus embraced all the known species, and its present richness, when many genera are necessary to ex­hibit all its variety and fulness, affords a pleasing argument in behalf of the zeal and inquisitiveness of modern naturalists. Peron and Le Sueur, with a good knowledge of what had been done by others, and with much new information acquired in their voyages, were the first to attempt the orderly arrangement of the Medusides ;@@\* but it was found to be too artificially constructed, and has not been adopted by subsequent systematists. Lamarck's method, which was based on Peron and Le Sueur’s, has the recom­mendation of greater simplicity. It is as follows :

RADIARES MEDUSAIRES.

*\* One mouth only in the inferior disc of the umbrella.*

1. Umbrella without pedicle, or arms, or tentacula.

[*a*] No lobes or appendages on the margin of the umbrella. Eudora. Phorcynia.

[*b*] With lobes or appendages on the margin.

Carybdea.

2. Umbrella without a pedicle, and armless, but furnished with

tentacula.

Equorea.

3. Umbrella without a pedicle, but with arms@@6 below, and generally

with tentacula on the margin.

Callirhoe.

4. Umbrella with a pedicle, with or without arms. No tentacula

at the margin.

Orythia.

5. Umbrella with a pedicle, with or without arms : tentacula on

the margin.

Diane·.

*♦ \* Several mouths in the inferior disk of the umbrella.*

1. Umbrella without pedicle, arms, or tentacula.

Ephyra.

2. Umbrella without a pedicle or arms, but with marginal tenta­

cula.

Obelia.

3. Umbrella without a pedicle, but furnished with arms under­

neath. No marginal tentacula.

Cassiopea.

4. Umbrella without a pedicle, but with arms underneath, and marginal tentacula.

Aurelia.

5. Umbrella having a pedicle and arms, but no marginal tentacula. Cephea.

C. Umbrella having a pedicle and arms, and marginal tentacula. Cyanea.@@7

The following table gives a synoptical view of the system adopted by Eschscholtz in his work on this order,@@6 which has a high reputation, and is founded on much personal observation.

1. Μ. Discophorae.

Medusæ with a large central digestive cavity, and for their only locomotive organ a gelatinous disc in form of an umbrella, constituting the greater part of the body.

Section 1.—Phanerocarpæ.

*The ovaries are visible.*

|  |  |  |  |
| --- | --- | --- | --- |
| **Family 1st.**  **Rhizostomidæ -** | **Cassiopæa. Rhizostoma. Cepnea.** | **Family 2d. Medusidæ.... -** | **Sthenonia. Medusa. Cyanea. Pelagia.**  **Chrysaora. Ephyra.** |

@@@1 Tiedemann’s *Comp. Physiology,* i. p. 259. See also a summary of Spallanzani’s experiments in Griffith’s *Cuoier,* xii. p. 567.

*@@@- Comp. Physiology,* p. 269.

@@@, Hence they were named *Urticæ marina:* by the older naturalists, and *sea-nettles* by the common people. What Aristotle and Pliny meant by their stinging acalephes is very doubtful, as is shewn by Kirby in *Bridgeur. Treatise,* p. 402, &c*.*

*@@@\* Hist. Nat. des Vers,* p. ii. 163-4. Also Griffith’s *Cuvier,* xii. p. 568.

*@@@i Annales du Museum, tom. sir.*

@@@β Under the name of arms, Lamarck embraces the *labial appendages* of every kind.

*@@@1 Anim. sans Vertèbres,* ii. p. 491.

*@@@β System der Acalephen.* Berlin, 1829, 4to.