

racoid bone or upper axilla of the pectoral fin. The lower edges of the suboperculum and interoperculum are free and overlap the conspicuous gill-rays, which are six in number, strong, round and curved. The gill-opening, though low, is moderately large, and extends forwards to beneath the joint of the lower jaw. The humeral chain consists of suprascapular, scapular and coracoid.

The scales are cycloid, tiled, exposing a longitudinally elliptical surface and firmly imbedded in the skin. There are about thirty in a vertical row. The lateral line is composed of fifty small eminences, and terminates opposite to the tenth dorsal ray.

RAYS:—Br. 6; D. 70; A. 59; C. 9; P. 10; V. 0.

All the rays of all the fins are jointed: the first rays of the dorsal and anal are simple; the other rays of these fins are divided at their tips into about four branches which do not spread, and the rays are slender and stand well apart in the strong membrane. The dorsal rays increase gradually in length from the first to near the middle of the fin, after which they continue equal to the end of the fin. The anal is more nearly equal throughout. Both fins are pointed at the end, but the points are not conspicuous, the space between them being filled by the caudal fin, whose rays are much finer, more crowded and somewhat shorter. The pectoral is small and rounded, its rays slender, crowded and branched. The interspinous bones of the back correspond in number with the dorsal rays.

DIMENSIONS.		inches.
Length from intermaxillary symphysis to end of caudal fin...		13·80
_____ base of ditto		13·38
_____ beginning of anal .		4·50
_____ centre of anus.....		4·25
_____ beginning of dorsal		2·35
_____ gill-opening		1·65
_____ centre of eye		0·65
Length of rictus of mouth		0·60
_____ lower jaw		1·15
Diameter of eye		0·22
Height of head		0·95
_____ body about		1·30
_____ dorsal fin posteriorly		0·60
_____ anal fin		0·35
Length of pectoral fin		0·45

XXIV.—*Additional Observations on the Polygastric Sacculi.*

By JOHN WM. GRIFFITH, M.D., F.L.S. &c.

To the Editors of the Annals of Natural History.

GENTLEMEN,

A PAPER having been inserted in the last number of your Journal (p. 104) by Mr. Addison, tending to the conclusion that the inaccu-

rate interpretation I attributed to him was rather my own, I crave the favour of a few lines to reply. In the first place be it noticed, that the quoted remarks relating to this part of the subject in my paper were extracted (as distinctly stated) from the 'Prov. Med. Journal' for 1842, as read before the British Association; therefore observations since made in any 'Experimental Researches' published in the following year, clearly can have nothing to do with the matter. It must also be observed, that my observations were on the *Polygastrica*, not on *Paramæcium*, although what applies to one will, I believe, apply to the whole.

My object in adducing "physical reasoning" was not to attempt to show what any living structure could or could not do, because I appealed to experiment and observation first, and subsequently applied reasoning to explain what I saw; the explanation of the *causes* of which appearances must be sought in reasoning alone.

As regards the bursting of pollen grains when acted on by solution of potassa, this is again a decided misinterpretation, and the cause of this appearance is only to be found in repeated experiment and careful reasoning. When water, solution of potash, or acid are added to pollen grains, imbibition and swelling take place; when water, acid, or weak potash water are used, the pollen tubes are generally thrust out at the same time, and the fovillary matter can be seen within; but when a stronger solution of potash is added immediately as the pollen tube begins to be emitted, it is deprived of its covering of intine by the solvent action of the reagent, and the fovillary particles are emitted, thus giving the appearance, which, hastily interpreted, is called bursting. The physical reasoning is therefore equally cogent as regards the pollen and the animalcules. The "vesicular" appearance seen in the animalcules after the addition of potash can also be seen in the case of the pollen, and when the solution is not sufficiently strong to dissolve the intine covering of the pollen tube, the whole grain shrinks or becomes contracted. When we neutralize the liq. potassæ exactly with nitric acid previously to adding it to the *Polygastrica* (whereby the solvent action of the liquid is destroyed, but its density not materially interfered with), we have exosmosis produced, *i. e.* instead of swelling they become contracted and shrivelled. This is a very interesting fact, and clearly shows that the density of the liquid cannot be concerned in the production of the "imbibition," but that it must be attributed solely to the chemical action of the potash. I may here recall to the reader's mind, in conclusion, the object I had in making any observations relative to the "imbibition" which was stated to take place in the polygastric sacculi,—it was to disprove the conclusion arrived at by Mr. Addison, viz. that these "stomachs"

perform their function by imbibition, which, I believe, in my former paper I showed to be thoroughly unfounded.

Your obedient servant,

J. W. GRIFFITH.

XXV.—*Observations on the genus Mougeotia, on two new Genera of Freshwater Algæ, and on Tyndaridea, with descriptions of species.* By ARTHUR HILL HASSALL, Esq.

[With a Plate.]

GENUS MOUGEOTIA.

THE real nature of the genus *Mougeotia* does not hitherto appear to have been at all understood, and consequently the definitions given of it up to the present time are either erroneous or incomplete.

Vaucher thus defines the genus *Mougeotia*:—" *Conjuguées à tube intérieur.*" And Agardh as follows:—" *Fila articulata reticulata conjuncta, granulis absque ordine dispositis, fructibus in angulis reticuli collocatis.*"

The first of these definitions is imperfect, and the second inaccurate, inasmuch as it contains a reference to perfect fructification distinct from the granules or zoospores.

The true and original species of the genus *Mougeotia* are all characterized by the singular fact, that sporangia, which Agardh calls the fruit, are never found in them as they are in all other species of the conjugating tribe of *Confervæ*. The filaments do indeed unite, but no transference of the contents of one cell into the interior of the other, and consequently no formation of sporangia, ever take place.

This remarkable circumstance in the history of the genus *Mougeotia*, resting as it does on long-continued and careful observation of the species composing it, does not admit of the smallest doubt, and although not absolutely stated as a fact, is yet strongly implied by Vaucher in his description of *Mougeotia geniflexa*, in which the following observations occur:—

"This *Conjugata* has not presented to me the round globules of the other species of the same family; on the contrary, the green matter which it incloses hath appeared to me to present nearly the same form, so that I know not how the grain is formed, nor in what way the development in this species is brought about; only I have remarked distinctly three or four bright grains immersed in this green matter, and I have seen in the month of April the cells separate from each other and sink in the water, but I traced them no further. Nevertheless, I have difficulty in believing that the brilliant grains are not the germs.

"Since writing this description I have seen the germination of



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