quelque branche de l'industrie humaine, il donne au peuple qui s'en empare le premier, ou qui l'exploite sur la plus grande echelle, un puissant moyen de supériorité sur les autres peuples. Souvent, enfin, le renversement des rapports de prosperité, de richesse, et de puissance entre les nations, est la suite necessaire de l'adoption et du progrès des *applications* d'une espèce nouvelle de forces mecaniques."—*Dupin.*

A few Remarks on the class Mollusca, in Dr Fleming's *Work on British Animals; with Descriptions of some new Species.* By George Johnston, M. D. Fellow of the Royal College of Surgeons of Edinburgh.—(Communicated by the Author.)

OUR progress in the study of invertebrate animals, has heretofore been much retarded by the labour of consulting many unconnected volumes, through which our knowledge lay scattered; and still more by the imperfections of the system which their authors had adopted. Beings of the most dissimilar structure, and of the most opposite habits, were associated under one common name; and the learner went on, puzzled and perplexed, until repeated failures had taught him, that, in consulting their books, he was to be guided neither by adherence to the characters they choose to assign to their divisions and genera, nor by attention to nature, but by random, or a certain tact only acquired after much fruitless labour. The pertinacity with which the system of Linnæus has in this country been adhered to, is indeed remarkable. His System of Botany was confessedly left in a more finished and perfect state than his System of Zoology; and yet botanists have not ceased, from the day of his death to the present time, to alter and amend that system. On the contrary, our leading zoologists bound themselves in willing fetters, deprecated any alteration, however obvious, and pleased themselves with laudatory pæans. Happily those days are past; and, though foreigners have led the way to better systems, and consequently to a more accurate and extended knowledge of animated beings, yet the example of our present naturalists justifies the belief that we shall not long be second in this race of science.

The system which Dr Fleming has adopted is a modification

of Cuvier's, and is founded on the basis of structure and function. It is commensurate with the present state of the science; and, in following it, the student will not meet with, as in preceding works, any very unnatural or ridiculous associations; though, at the same time, we wish not to conceal our opinion, that the arrangement here developed will not, we fear, be generally assented to. Nor is this a matter to be lamented; for there can no harm arise from a multitude of systems, provided we can only agree in a uniformity of nomenclature, so far as regards the genera and species. A change in *these* is a positive evil, and never to be made without sufficient reason; but a new system, by presenting the objects under various aspects, and placing, in a more or less prominent view, the organs of different functions, is in fact beneficial to the progress of knowledge.

But we have no intention to enter into a review of Dr Fleming's work; we wish merely to submit a few remarks, as they presented themselves, on examining that portion of it which is devoted to the elucidation of Molluscous Animals.

And first it seems to us, that Dr Fleming would have done well to have quoted more frequently than he has done, the "Histoire Naturelle" of Lamarck. That work is in general use amongst the naturalists of this country; and it is necessary that the student should be acquainted with its language or synonymes, whether he may choose to adopt them or not. This consideration should have prevailed with Dr Fleming, in opposition to any private opinion he may have formed of the merits of that production: and it is surely worth quoting; for the systematic part is both ably and ingeniously executed, though we are free to admit, that the changes in the nomenclature are not to be vindicated, and the physiological speculations are puerile and absurd, and have none of that originality apparently claimed.

Spirula australis was first added to our Fauna by Mr Stewart, the author of Elements of Natural History. His specimen was procured from Aberlady Bay.

Loligo sepiola we have from the coast of North Durham; and from the same coast we procured the *Octopus octopodia*, a fine specimen of which was sent some months since to the conductors of the Zoological Journal, under the impression of its not having been previously observed. The *Lol. sepiola* was brought

to us alive, though in a languid state, and it continued so for about twelve hours, yet it never discharged any inky fluid, nor was the spirit in which it was preserved tinged in the slightest degree.

In *Arion* and *Limax*, the mouth is a short retractile proboscis, armed on the upper lip with a semilunar horny plate, the concavity turned downwards, and a blunt tooth projecting from its centre. In the first genus, the margin of the shield is entire; in the latter, it is cleft below the pulmonary aperture. In giving "black tentacula" to *Limax agrestis*, as a specific character, Dr Fleming has incautiously copied his predecessors; for, in truth, they are not black, but like to the body in colour, as an examination of the first individual that crawls across his path will convince him. We add a description of what we consider a new species of *Arion*.

1. A. CIRCUMSCRIPTUS.

Body greyish-black, spotted, with a black fascia round the shield and body; the respiratory aperture anterior.

Limax agrestis? Latham, Lin. Trans. iv. 85. t. 8. f. 1, 4.—*L. marginatus*? Muller, Verm. ii. 10.

Hab.—Moist meadows, hedge-banks, &c.—Common.

Desc.—Body 1 or 1½ inch long, not keeled, nor much narrowed at the tail; greyish black, marbled, with a narrow fascia surrounding the back and shield; sides bluish-grey; foot white, opaque; tentacula rather short, black; respiratory aperture placed very forward on the shield, which is entire; mucous pore very distinct, above the tail; the young are white or straw-coloured, with blackish head and tentacula.—This species has probably been passed over as a variety of *Limax agrestis*. We have found it very uniform and constant in its character, though it may possibly be the *Ar. ater* in an immature state.

In the genus *Helix*, we find two species which Lamarck has, perhaps with greater propriety, placed in the genus *Carocolla*. These are the *H. albella* and *elegans* of Draparnaud. The *H. nitida* and *nitidula* of the last author, and the *H. alliaria* of Mr Miller are brought together as synonymous; and, in confirmation of this arrangement, we may mention an experiment which we lately made. Four specimens of equal size, and alike in colour, and in the number of their whorls, were taken from beneath one stone. None of them had any smell while alive; but, on immersing them, one by one, in hot water, two emitted

a very strong alliaceous smell, in one it was faint, and in the other it was not perceptible. It would appear, therefore, that the animal has the power of retaining or emitting its peculiar odour at pleasure; and that, in death, its emission may be prevented by accidental circumstances. I could not satisfactorily ascertain its source; but it appeared to arise from a yellowish fluid pressed out from above the head. I cannot so unhesitatingly assent with Dr Fleming, in considering the *H. caperata* of Montagu as synonymous with the *H. striata* of Draparnaud. The latter is the most common of all shells in the vicinity of Berwick, and the white rib within the outer lip is a constant character. Now, Montagu takes no notice of this in his description; and we all know how minute his descriptions are; while Dr Turton expressly states, that the *H. caperata* is to be distinguished from *H. virgata*, "in wanting the thread-like rib round the inside of the lip." Moreover, the figure of Montagu is not at all like to the *H. striata*.

Though the construction of the genera of the remaining land and aquatic *Pulmonifera* might afford occasion for remark, we shall now pass on to the naked *Branchifera*. In *Tritonia*, we observe, that the *T. coronata* which is a native of the Frith of Forth, was not known to the Doctor; and the two species which follow do not appear to have been yet described.

1. TRITONIA PLEBEIA.

Body oval, narrowed behind, greyish; superior tentacula multipartite, cylindrical; branchiæ uniserial, dendroidal.

Hab.—The sea near Berwick.

Desc.—Body one inch long, 4 lines broad, truncate before, tapered to a narrow point behind, limaciform, greyish, irregularly speckled and blotched with brown. Back slightly convex; sides abruptly flattened with the markings of a deeper colour; foot white. The anterior margin of the cloak, above the mouth, is cut into 6 or 7 short conical filaments, partly retractile. A little behind are the two short cylindrical sheaths from which the tentacula issue. These consist of a fascicle of filaments united at the base; and arranged apparently round a central pillar of whiter colour; and are only displayed when the animal is active and in motion. Along the margins of the back there are 5 or 6 branchial processes, gradually decreasing towards the tail, and having an apt similitude to an old and leafless tree in miniature.

2. TRITONIA PULCHRA.

Body oblong, red with 3 whitish transverse bands, and marked with minute ocellated spots.

Hab.—The sea near Berwick.

Desc.—Body rather more than ¼ inch long, oblong, of equal breadth throughout, of a fine red colour with dark spots, and 3 narrow white transverse bands. The back when minutely examined is observed to be marked all over with ocellated spots, of which the ring is white and the eye red. Anterior margin of the cloak white, rounded and emarginated in front, and the sides tuberculated. Superior tentacula exactly like those of the preceding species. On the margins of the back are several branchial processes or tubercles, some of which are branched. I have had 3 specimens of the *Trit. pinnatifida* from the same coast.

I cannot agree with Dr Fleming in considering the *Doris papillosa* of Montagu, and the *D. vermigera* of Dr Turton as the same species. In the former the superior tentacula are said to be annulated, a structure which we did not observe in specimens of the latter which we found on the neighbouring coast; in the *D. papillosa*, the lateral papillæ or branchial filaments are stated to be subclavate, in the *vermigera* they are linear, or conical; and the latter wants the bare triangular space on the anterior part of the back, as represented in Montagu's figure, and taken notice of in the description. The *Eolis peregrina* is said by Dr Grant to inhabit the Frith of Forth, though not described either by him or Dr Fleming.

The *Valvata cristata* is mentioned as a native of England only. It occurs in abundance in the Whitadder, a river which runs through Berwickshire, and is therefore to be added to the Scottish Fauna. Though we have kept it by us days and weeks, we have not yet had the pleasure of seeing it protrude its beautiful plumose branchiæ.

We feel indebted to Dr Fleming for his elucidation of the genus *Chiton*, which was getting into confusion, and chiefly from a neglect of what he had done many years ago, in the article "Conchology" in the Edinburgh Encyclopædia. That excellent article has been strangely overlooked by subsequent conchologists. It is true Dr Turton, in his Conchological Dictionary, has once or twice referred to it, but so inaccurately as to statisfy us that he had not consulted it, a circumstance rather

surprising in an author who has dwelt with unusual severity on similar inaccuracies in others. Dr Fleming has omitted the *Ch. punctatus* of Turton, in the probable belief that it is merely an imperfect specimen of some other species. On the coast of North Durham we have collected the *Ch. marginatus*, *ruber*, *cinereus*, and *lævigatus*,—the first very common, and of a large size, the three latter all very rare.

The genus Bulla is left much as our author found it, and there is perhaps no one in the sytem of which so little is known. We add the description of a species which appears to be new.

1. BULLA PUNCTURA.

Shell oblong-oval, opake, white, marked with numerous close transverse punctured striæ.

Hab.—Sea coast near Berwick.

Desc.—Shell 4 lines long, thickish; apex with a very narrow perforation. It resembles the *B. ampulla* of Montagu in shape, but is distinguished by having the whole surface punctured, and these punctures are arranged in regular striæ. Only one specimen has occurred, and a part of the outer lip appears to have been broken off during the animal's life, and again renewed. This portion is smooth.

In the *Holostomata* we could have wished that Dr Fleming had adopted the genus *Lacuna* of Dr Turton, instituted for the reception of some closely allied species which we find placed in the genera *Turbo* and *Natica*. The *Nerita pallidula* of British authors, and its allies, are certainly not *Naticæ*, for the perforation is on the pillar and not behind it, and the eyes of the animal are inserted on a bulging part of the base of the tentacula, and not elevated on peduncles. The *Turbo margarita* also affords a good instance of the empiricism which we think we observe to prevail in the establishment of genera; and of which other illustrations might readily be adduced *. Captain Laskey, its discoverer, and Mr Montagu, made it a *Helix*; Dr Leach considered it *sui generis*, and called it *Margarita*; Dr Turton and

* We cannot, for example, conjecture on what principles the establishment of such genera as *Montagua*, *Aplexa*, *Myxas*, *Balea*, &c. can be justified. The class *Conchifera* will afford, we think, similar examples; and we may remark that in that class too much importance has been attached to the cardinal teeth as furnishing generic characters.

Mr Lowe removed it to *Turbo*, and for doing so the latter was rebuked by Mr Gray, who maintained, that, with Linnæus, it could be nothing but a *Trochus*, and in this opinion Mr Lowe afterwards coincided, though on grounds which are unintelligible to us. In face of the censures of Mr Gray, however, here we have it again a legal *Turbo*,—and if the student asks a reason for these changes, there is none to give, unless the whim of each naturalist is to be considered as reasonable. If we consider the genus *Margarita* as unnecessary, and in our humble judgment it is so, then we submit the species in question is a *Trochus*, and we rest our opinion, not so much on the general contour of the shell, as on the structure of the animal. No true *Turbo*, so far as we are aware, has the sides furnished with tentacular filaments; but these organs are general in the *Trochi*. Now, the animal of *T. margarita* has four of these filaments on each side, and the margin of the cloak between the tentacula is beautifully crenulate; and further, the eyes are on pedicels, a character in which it likewise agrees with *Trochus*, and differs from *Turbo*. The species which Dr Fleming has admitted into the genus *Phasianella* have a very doubtful claim to their place; and none at all, if we agree with Mr Sowerby in restricting it to such as have a calcareous operculum. The *Cingulla pulla*, in his view, is a true *Phasianella;* and there is, moreover, sufficient in the structure of the animal to induce us to remove it from the *Cingullæ*, for these, if we are entitled to form a conclusion from the recent species common on our shores, have no additional tentacula, and a very thin horny operculum. The *Phasianellæ* of Dr Fleming might perhaps constitute a new genus

The following species appears to be nondescript.

1. CINGULLA PULCHRA.

Shell conical, white, with two rows of brown spots on the whorls, which are spirally striate.

Hab.—Sea shore near Berwick.

Desc.—Shell 1½ line long, conical, glossy, spirally striate, white, with two rows of oblong reddish spots on the body and second whorls: striæ regular, impressed. Whorls 6, rounded and well defined. Aperture roundish, narrowed above, with even margins, and a slight perforation behind the pillar.

Obs.—A much prettier shell than the *C. interrupta*, from all the varieties of which it is readily distinguished by its spiral striæ. From the *C. cingilla* it differs in form and in markings.

Of the pretty and rare shell named *Velutina stylifera* we have a specimen in our small collection from the coast of North Durham, and taken, as Dr Turton's specimens also were, from amongst the spines of the *Echinus esculentus*. We can confirm the assertion of Dr Turton of its having no operculum, but unfortunately at the period it occurred to us, we were more intent on collecting species than observing their habits and structure, and can at present add nothing more to its imperfect history.

It was my intention to have reviewed in a similar manner the remaining orders and families, but as our remarks consist, we find, in mere differences of opinion, we shall not extend a paper which has already exceeded the limits at first proposed. So far as we are aware the enumeration of the species seems most complete, nor do we observe an omission except that of *Planaxis mollis* and a nondescript *Ianthina*, which, it is said, have been added to our Fauna by Dr Leach. We may be allowed also to express a regret that Dr Fleming should have followed Turton in affixing the name of the learned Dr Goodall to a genus of bivalve shells, which future observations may prove have no claim to a place in the system. Mr Sowerby has already pronounced one of the species to be the young of an *Astarte*, and it seems insinuated that the other species has no better claims to be considered distinct.

April 1. 1828.

Defence of Christianity, or Conferences on Religion; (Defense du Christianisme, ou Conferences sur la Religion.) By M. de Frayssinous, Bishop of Hermopolis, First Almoner to the King of France, Minister for Ecclesiastic Affairs and Public Instruction. 3 vols. 8vo. Paris.

Moses considered as a Historian of the Early Ages, t. ii. p. 49.

M. Frayssinous, in his Conferences, considering Moses as a historian of the early ages, examines his narrative, with reference to the two principal facts recorded in Genesis, namely, the

THE

EDINBURGH NEW

PHILOSOPHICAL JOURNAL,

EXHIBITING A VIEW OF THE

PROGRESSIVE DISCOVERIES AND IMPROVEMENTS

IN THE

SCIENCES AND THE ARTS.

CONDUCTED BY

ROBERT JAMESON,

REGIUS PROFESSOR OF NATURAL HISTORY, LECTURER ON MINERALOGY, AND KEEPER OF THE MUSEUM IN THE UNIVERSITY OF EDINBURGH;

Fellow of the Royal Societies of London and Edinburgh; of the Antiquarian, Wernerian and Horticultural Societies of Edinburgh; Honorary Member of the Royal Irish Academy, and of the Royal Dublin Society; Fellow of the Linnean and Geological Societies of London; Honorary Member of the Asiatic Society of Calcutta; of the Royal Geological Society of Cornwall, and of the Cambridge Philosophical Society; of the York, Bristol, Cambrian, Northern, and Cork Institutions; of the Royal Society of Sciences of Denmark; of the Royal Academy of Sciences of Berlin; of the Royal Academy of Naples; of the Imperial Natural History Society of Moscow; of the Imperial Pharmaceutical Society of Petersburgh; of the Natural History Society of Wetterau; of the Mineralogical Society of Jena; of the Royal Mineralogical Society of Dresden; of the Natural History Society of Paris; of the Philomathic Society of Paris; of the Natural History Society of Calvados; of the Senkenberg Society of Natural History; of the Society of Natural Sciences and Medicine of Heidelberg; Honorary Member of the Literary and Philosophical Society of New York; of the New York Historical Society; of the American Antiquarian Society; of the Academy of Natural Sciences of Philadelphia; of the Lyceum of Natural History of New York; of the Natural History Society of Montreal, *&c. &c.*

APRIL...SEPTEMBER 1828.

TO BE CONTINUED QUARTERLY.

EDINBURGH:

PRINTED FOR ADAM BLACK, NORTH BRIDGE, EDINBURGH;

AND LONGMAN, REES, ORME, BROWN, & GREEN,

LONDON.

1828.