

Science, if he had restricted himself to journals, reviews, &c., of acknowledged literary merit, or treating specially of Natural History. Who, with a grain of common sense, cares to know, or attaches a shade of value to, the scientific opinions of such periodicals as the *Doncaster Gazette*, the *York Herald*, the *Derbyshire Advertiser*, the *Yorkshire Gazette*, the *Worcester Journal*, the *Bromsgrove Messenger*, the *Yorkshire Post*, *Our Own Fireside*, the *Oriental Budget*, the *Threepenny Magazine*, the *Penny Post*, the *Rock*, or the *Record*? This kind of puffing (for we can find no other term to express our meaning plainly) is bad enough; but there is worse, far worse, to come. It surely cannot have been with the knowledge and concurrence of "The Rev. F. O. Morris, B.A., Rector of Nunburnholme, in this county, and Chaplain to his Grace the Duke of Cleveland," as he is designated in the *York Herald*, that a series of anonymous opinions on his "Difficulties of Darwinism"—many of them abounding in the most gross and fulsome flattery of himself, and in vulgar abuse of his opponents—have been appended to the more legitimate notices of that book. Lest we should be supposed to be using unnecessarily strong language, we shall quote a few of these precious criticisms:—

"Professor Huxley's letter to you is in his usual style—flippant and rude. Your reply is in every way admirable.—Professor —."

"I have read your pamphlet, and do not see how it can be answered.—Esq. M.D., A.B."

"Prof. Huxley's impertinent letter deserved what it has got. You certainly have given him a castigation.—Rev. —, Cantab."

"The papers here steer shy of your pamphlet. They are on the other side, and find it awkward to reply to. I am very glad to hear that you purpose meeting Huxley at Liverpool. He requires a man that can expose his shuffles, and turn his banter against himself.—Rev. —, D.D."

"Glad to see you an opposer to Darwin's nonsense.—, Esq."

The last of these absurdities is apparently a round-robin printed in a straight line: "We agree with all you say most perfectly. We cannot imagine how it can be answered by the Darwinites." Then follow three dashes.

Mr. Morris is not merely a well-educated English gentleman, but a clergyman and chaplain to a duke; and we feel that we are doing him a service in giving him an opportunity of stating (1) whether these extracts are really taken from letters addressed to himself, or whether they are forgeries; and, (2) in the former case, of explaining how they found their way into print in this obnoxious form.

A geological friend of ours, while trying to make a short cut, trespassed on a railway line. He had not gone far before he was stopped, and told by a grim official to retrace his steps. Our friend, thinking that a little "soft sawder" might help him out of the difficulty, observed: "My good fellow, you are perfectly right, and are only doing your duty; but I am much mistaken, when I look at your kindly and good-natured face, if you are the sort of man to turn a harmless geologist a couple of miles out of his route." The heart of the guardian of the road was so far softened by this speech as to let our friend proceed rejoicing, but, as a parting shot, he observed:—"Well, sir, I *do* like a bit of butter, but I ain't partial to

grease." Now, to apply this anecdote, we sadly fear that Mr. Morris is "partial to grease." Many clergymen indulge in this taste, and one who has associated so much as this distinguished naturalist has done with the *Dii Majores* is apt to grow unctuous. On the assumption that these extracts are genuine, we can fancy that he carried the parcel of letters in his coat-tail pocket when visiting his parishioners, and occasionally sat down to enjoy a bit of grease, or, in other words, to read one or two extracts, as a cheerful mental stimulant; that probably on one occasion, the stimulant was too much for him, and that he inadvertently left the packet "*sub tegmine fagi*;" and that an enemy (probably a rabid Dissenting minister of a low class) picked up the prize, at once saw its value as a weapon against the Church of England, and gave it up to the Elders of his congregation, on the condition that they should publish it. It was then probably placed in the hands of a literary gentleman—possibly the Editor of the *Threepenny Magazine* or the *Penny Post*—and thus, and thus only, the appearance of the pamphlet can, we think, be rationally accounted for.

#### OUR BOOK SHELF

*Resources of the Southern Fields and Forests, Medical, Economical, and Agricultural.* By Francis Peyre Porcher, M.D. (Charleston: 1869.)

In this book we have very full accounts of the uses of the plants of the Southern States of America. The author freely acknowledges in his Preface (or, as it is here termed, "Preliminary,") that he has availed himself largely of numerous works on kindred subjects, most of which have been published in America. In the introduction a few practical instructions are given for collecting and drying medicinal products of the vegetable kingdom. The plants are arranged according to their natural orders, the vernacular names being placed first, followed by the scientific names, and the distribution of the plants in the States. No attempt is made either at a scientific or popular description of the plants themselves; so that the book is literally what it professes to be, without being made bulky with matter that can, if required, be found in floras or purely botanical works. The book, indeed, is written more with an eye to the exposition of the medicinal uses of the plants; but the "economical and agricultural" portion is by no means lightly treated. In short, the information is most varied, as will be seen from a few quotations. Here is a recipe for making blacking from elder-berries, certainly an application we never before heard of:—"Boil elder-berries well, mashing the pulpy matter; then strain through a colander, and bottle for use. The liquid sours somewhat by age, but retains its qualities. Another way is to simmer ripe elder-berries over a slow fire in an iron kettle for one hour and let the mass cool, and you will have good blacking." Under the head of White Beech (*Fagus sylvatica*, and *F. americana*) our author tells us "the leaves of the beech trees, collected in autumn in dry weather, form an admirable article for filling beds. The smell is grateful and wholesome, they do not harbour vermin, are very elastic, and may be replenished annually without cost." There is nothing new in this application of beech leaves; they are used in many parts of Europe for a similar purpose, and were at one time so employed in England. Evelyn speaks of them as affording "the best and easiest mattress in the world to lay under our quilts instead of straw;" and by way of recommendation says that "divers persons of quality in Dauphiny" use them. The above are examples of what may be called purely economical applications. We take a cruciferous plant, the Gold of Pleasure, or False Flax

(*Camelina sativa*) as a single example of agricultural produce. "The cultivation of this plant for the seed would repay the farmer; an abundance of chaff would be produced which would be of infinite service for horses or for manure. In a grazing country like England, where vast sums are annually expended for foreign oil-cake, the Gold of Pleasure will soon be found an excellent substitute under manufacture, and, consequently, a grower should find a good remuneration in cultivating the seed. The oil-cake has been found highly nutritious in the fattening of sheep and oxen, as it contains a great portion of mucilage and nitrogenous matter, which combined are found very beneficial in developing fat and lean." The prospects of making this a most important agricultural plant are, we think, too brightly drawn, considering that it has not escaped the notice of English agriculturists. Nevertheless, a few words of this kind on different products might help to promote experiments on their culture and utility. The writer's aim throughout seems to be a general utilisation of vegetable productions, and he very ingeniously finds a variety of application for those of the Southern States. We do not hesitate to say that a few books of this description on the economic products of different parts of the globe, would make us much better acquainted with the true value of the vegetable kingdom than we are at present.

JOHN R. JACKSON

*Adventures of a Young Naturalist.* By Lucien Biart. Edited and adapted by Parker Gillmore. (London: S. Low, Son, and Marston, 1870.)

THIS is a narrative of travel in Mexico, intended especially for young people interested in Natural History. The party consists of a young lad the hero, his father, a Swiss naturalist who does all the moralising, a dog, and one of those half-bred Indians who know everything and can do everything, who are such a bore in most books of Western travel. Though written in a somewhat pedantic style, we have no doubt it will find many admirers among our adventure-loving young readers, the country described being one of unsurpassed beauty and interest. For our own part, we should decidedly object to being cross-examined in the following manner before being allowed to eat our breakfast. "Do you know the family of the animal we are going to have for breakfast?" asked Sumichrast. "Yes; it is a Rodent." "Well done; but how did you recognise it to be so?" "By the absence of canine teeth in its jaws, its large incisors, and its hind-legs being longer than its fore-legs." Especially if the lesson were given in such a confused style as this:—"The bird belongs to the family of Climbers, that is to say, to that order which have two toes in front of their claws and two behind, like your great friends the parrots." Still the young naturalist will find in the book much that is interesting and amusing; and the numerous illustrations and gorgeous binding will make it an acceptable present during the Christmas season.

## LETTERS TO THE EDITOR

[The Editor does not hold himself responsible for opinions expressed by his Correspondents. No notice is taken of anonymous communications.]

### Contribution to the Dioptrics of Vision

IN the course of some experiments in reference to vision under water, I have ascertained some facts which I do not remember to have seen mentioned by writers on optics, and which may perhaps interest your readers.

Every swimmer knows that, however clear the water may be, and however distinctly he may see from the bank the smallest particle of gravel or weed, the moment he plunges beneath the water all becomes obscure, and he can see the outline of nothing at the bottom or suspended in the water distinctly, but only blurred patches of various colours. In my first endeavours

to find a remedy for this imperfect vision, I found two ways of restoring perfect sight. The one was to surround the eye with a watertight box, with a piece of plain glass in front. By this means, the eye being in the same condition as to receiving the rays of light through an aerial medium as when we are on land, perfect vision is retained beneath the water. The other was, allowing the eye to remain exposed to the water, to look through a glass lens whose proper focal distance in the air, I found, after numerous trials, to be half an inch. The first method is attended by the disadvantages that the glass soon becomes dim from the condensation of vapour, and it is difficult to make it fit so accurately as to exclude the water; the second is more convenient, as any optician can construct a pair of spectacles suitable for the water, and fitted with lenses of the required focal distance.

Fishes, cetaceous animals, and seals, see perfectly below the water, while man's vision, unassisted, is of the most imperfect character. The eyes of these marine animals differ from those of terrestrial vertebrates chiefly in this: the latter have a very convex cornea, with a large chamber containing aqueous humour and a double convex lens behind; whereas the former have a flat cornea, hardly any aqueous humour, and a spherical lens, lying, at least in fishes, close behind the transparent membrane which is their substitute for a cornea.

Now, as an optical instrument, the eye of terrestrial vertebrates—and let us take that of man for an illustration—consists of two lenses, one placed behind the other. The anterior lens is formed by the aqueous humour, its actual figure being a meniscus, one surface being convex the other concave, but both surfaces uniting if prolonged. According to Donders, the anterior radius of curvature, formed by the cornea, is 8 mm., the posterior, formed by the front of the crystalline, being 10 mm. The posterior lens is the crystalline, a double convex lens, its posterior surface, according to the same authority, having a radius of 6 mm. only. The combination of meniscus and double convex lens is known to possess peculiar optical advantages. The vitreous humour cannot act as a convex lens, its form being that of the concavo-convex lens, whose property is to cause divergence of rays of light; but, as it lies in contact with the retina, it cannot even produce this effect. It acts, together with the aqueous humour, as a watery medium for the suspension of the crystalline.

What happens when the human eye is immersed in water? A transparent lens-shaped body will refract the light in converging rays, if it is much denser than the surrounding medium through which the rays of light reach it. A simple experiment will prove this. Take two watch-glasses with their concavities facing one another; fill the space between them with water; this will form in air, than which it is so much denser, a lens of power proportioned to the convexity, but in water it will not refract the light at all, being of the same density as the light-conducting medium. The aqueous humour of the eye being much denser than the air, acts as a lens in the atmosphere, but being of the same density as water, when the light is transmitted to it through water in contact with the eye, we at once lose the use of our anterior lens, and can see nothing distinctly; because the crystalline, which alone now acts as a lens, throws its focus, as we shall presently see, beyond the retina.

How, then, are we to recover perfect vision under water? Obviously, by supplying the loss of our anterior lens by another lens of equal power. The focal distance in the air of a water lens of the meniscus shape and the dimensions given above may be calculated; it is, in fact, two inches or thereabouts; but, as we have seen, it = 0 in water. But, as the refractive power of a lens diminishes in proportion as that of the medium through which it receives rays of light increases, we find that a glass lens when immersed in water has only one-fourth of the refractive power it possesses in air. So, in order to supply the loss of our anterior lens, we find we must use a glass lens of about half an inch focus, which, in water, has a focus of about two inches. I need scarcely say, that in the case of a double convex lens of dissimilar curves it makes a great difference as regards the refractive power whether the lens be wholly immersed in water or one or other of the convex surfaces only. But I need not dwell on this subject at present.

But it is a clumsy method to supply the loss of a lens of two inches focus by one of the high refracting power of half an inch. Besides, a glass lens of this power is so small that the lateral field of vision is of necessity very limited, and it has a further disadvantage that we can see nothing with it in the air. I therefore sought for a lens that should be free from these defects.

As the ocular lens whose place had to be supplied is formed