baker do the same? Surely it is as noble and as glorious and as serviceable to one's country, to be engaged in clothing the naked and feeding the hungry, as in shooting and drowning our fellow creatures?

I have referred above only to the artisan, but have chosen him and the workshop merely for the sake of typical illustration; the remarks apply equally to all who are engaged in useful industry, to the distributor as well as to the producer, to the capitalist and organiser of labour as well as to the labourer himself. The grocer, for example, who should understand and take intelligent interest in the natural history of the products that cross his counter, and the social machinery that brought them there from all the corners of the earth, would be a very different being from the mere parcel-tying and change-counting machine that usually weighs our tea and coffee.

I have thus dwelt upon some of the grounds for giving special emphasis to the word "conscious," believing that the advocates of Technical Education are too apt to regard the subject from a merely technical point of view. It is of the utmost importance that we should be convinced of the perfect harmony which naturally and necessarily exists between moral and material welfare, when the best and soundest means of obtaining either one or the other are followed, especially as there does exist in the minds of a certain class, both of workers and dreamers, a foolish prejudice and misconception, leading them to regard the advocates of Technical Education as a set of cold-blooded materialists, who look upon the workman as a mere productive engine which they seek to improve only in order to get more out of him. My opportunities of learning the opinions and feelings of the better class of self-improving workmen have been rather extensive, and I have met with this idea more frequently than one might suppose were possible. Certain flashy and trashy hollow-headed writers, who are constantly babbling about "the materialistic tendencies of the age" have encouraged these ideas, and as the arts of smart writing and showy oratory are so very easily acquired, this class of sentimentalists is very numerous.

The work above-named, which has suggested these remarks, is published in shilling parts, each containing a large number of well-selected and well-executed illustrations of art workmanship, a supplementary sheet of detailed working drawings, and essays on art-industry and miscellaneous technological subjects. Most of the illustrations are representative of continental art, and the character of the whole work is essentially German, including the typography, and some clerical errors in the English. As the chief use of such a work is to supply the English manufacturer with ideas that may help to emancipate him from slavish adherence to mere trade customs and models, this feature is advantageous, provided it does not foster the too common fallacy of believing that our continental neighbours have a monopoly of artistic taste—a fallacy which is sometimes carried to the length of an extravagant prejudice.

I have little doubt that if an equal amount of industry and taste were exerted in selecting models from the English fittings, English furniture, and English ornaments of English mansions, another and retaliatory "Workshop" of equal intrinsic merit, and equally suggestive to the continental workman, might be compiled.

There are several designs for German porcelain stoves, which are especially worthy of the attention of the English manufacturer. Their value is not confined to their artistic merits; the introduction to this country of such stoves would add much to the comfort and economy of English households, by taking the place of our barbarous open fire-places which give 90 per cent. of their heat to the clouds, and with the residue roast us on one side while the other is exposed to the cold blasts that converge from all sides towards the chimney, round which we are compelled to huddle whenever we have any really cold weather, such as that of last winter. The contrast between the genial, well-diffused warmth of the sitting-rooms of a well-ordered North German household and those of English houses of a corresponding class is anything but favourable to "the Englishman's fireside;" and as reason has so little power against prejudice, it may be well to call in art to the aid of science, in order to try whether the elegant designs of some of the German fire-places may have some effect upon those who reply to all demonstrations of the inefficiency and wastefulness of the English fireplace, that they must have an open fire "to look at," or on account of its "cheerful appearance."

A work of this kind, that a man may purchase or borrow from a library, and thus deliberately study at home, has a special value over and above that of Art Museums and International Exhibitions, though of course in these he has the great advantage of seeing the objects themselves.

The great fault of the work is the want of direct connection between the letter-press and the engravings. There are essays on various branches of art-manufacture, and illustrations of these; but the illustrations are distributed at random throughout the work, which, although published in separate parts, has no part complete in itself. A re-arrangement and proper classification of the materials of this book would greatly increase its value. The publishers may possibly suppose that by devoting certain shilling parts to knockers, hinges, gates, railings, and other ironmongery illustrations, another part to jewellery, another to mantelpieces, others to cabinet-work, &c., they would be holding out an inducement to their customers to buy only isolated numbers, while by the present arrangement, which sprinkles each man's special requirements throughout the work, they compel their subscribers to take the whole series. Whatever be the motive or origin of this arrangement, or want of arrangement, the commercial result must be to prevent many practical men from purchasing it at all, who would be glad to possess those parts relating to their own trades. As a mere picture-book, the confused miscellaneous arrangement may be the most popular, it gives great variety to the contents of each number; but in reference to higher usefulness this is a serious drawback to the merits of an otherwise valuable work. W. MATTIEU WILLIAMS

LETTERS TO THE EDITOR

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

A New View of Darwinism

I AM much obliged to Mr. Howorth for his courteous expressions towards me in the letter in your last number. If he will be

so good as to look at p. 111 and p. 148, vol. ii. of my "Variation of Animals and Plants under Domestication," he will find a good many facts and a discussion on the fertility and sterility of organisms from increased food and other causes. He will see my reasons for disagreeing with Mr. Doubleday, whose work I carefully read many years ago.

CHARLES DARWIN

Down, Beckenham, Kent, July 1

THE very ingenious manner in which Mr. Howorth first misrepresents Darwinism, and then uses an argument which is not even founded on his own misrepresentation, but on a quite distinct fallacy, may puzzle some of your readers. I therefore ask space for a few lines of criticism.

Mr. Howorth first "takes it" that the struggle for existence "means, in five words, the persistence of the stronger." This is a pure misrepresentation. Darwin says nothing of the kind. "Strength" is only one out of the many and varied powers and faculties that lead to success in the battle for life. Minute size, obscure colours, swiftness, armour, cunning, prolificness, nauseousness, or bad odour, have any one of them as much right to be put forward as the cause of "persistence." The error is so gross that it seems wonderful that any reader of Darwin could have made it, or, having made it, could put it forward deliberately as a fair foundation for a criticism. He says, moreover, that the theory of Natural Selection "has been expressively epitomised" as "the persistence of the stronger," "the survival of the stronger." By whom? I should like to know. I never saw the terms so applied in print by any Darwinian. The most curious and even ludicrous thing, however, is that, having thus laid down his premises, Mr. Howorth makes no more use of them, but runs off to something quite different, namely, that *fatness* is prejudicial to fertility. "Fat hens won't lay," "overgrown melons have few seeds," "overfed men have small families,"—these are the *facts* by which he seeks to prove that the *strongest* will not survive and leave offspring! But what does nature tell us? That the strongest and most vigorous plants do produce the most flowers and seed, not the weak and sickly. That the strongest and most healthy and best fed wild animals do propagate more rapidly than the starved and sickly. That the strong and thoroughly well-fed backwoodsmen of America increase more rapidly than any half-starved race of Indians upon earth. No *fact*, therefore, has been adduced to show that even "the persistence of the stronger" is not true; although, if this had been done, it would not touch Natural Selection, which is the "survival of the fittest."

ALFRED R. WALLACE

Our Natural History Museum

IN a few days the country will be called upon to vote 30,000*l.* or 40,000*l.* towards the erection of the new Natural History Museum at Kensington. 7,000*l.* were voted last year for the purpose of drawing up estimates and preparing the site, and our present one at Bloomsbury has become such a crying evil that we can scarcely anticipate a refusal of the grant.

So liberal a sum being offered at the shrine of Science, the community at large will necessarily expect great things of her, and first among all a radical redress of all existing grievances. Yet, if rumour whispers true, the prospects of the future are scarcely so brilliant or pregnant with promises of better things to come as they should be. Plans have been drawn up and decided upon, and the chiefs of the present Natural History Departments have been subsequently consulted as to the amount of space required for the several collections under their charge.

This is itself a faulty commencement, for the building should be constructed for the requirements of the collections, and not the collections cut to the size of the building, and, as might have been anticipated, such policy already threatens to prove productive of disappointment and dissatisfaction. Some departments will profit by the change, while others, including the one mostly needing an enlargement of its borders, will absolutely have less than the present amount of space awarded it. We refer to the zoological one, whose present overcrowded and semi-arranged condition is a disgrace to the nation. And yet, on the completion of the present plans, this cramming process is threatened to be still further carried out, though it is to be hoped the voice of opposition and common sense will save us yet from so unfortunate a catastrophe. We hear again that no consideration whatever has been devoted to the subject of a library for the new building,

nor a single foot of space allotted to the purpose of constructing one. Such a blunder as this surpasses the first one. The scientific volumes in the present library are in constant requisition by the officers of the various departments to assist them in the determination and arrangement of the specimens. Many of these again are unique or only replaceable at a great cost, and the inconvenience and loss of advantages that will arise to the official staff on being separated from the collection of works they now have access to, cannot be over-estimated. If the Natural History collections must be removed, an edifice suitable for their thorough utilisation, and replete with every convenience for prosecuting scientific research, including efficient laboratories, should be erected.

But to commence at the root of the evil. No progress can be expected under present auspices, or so long as the chief administration of the establishment, and the appointment and promotion of all officers, is vested in the hands of some fifty or sixty trustees, out of whom not more than two can be said to take a direct interest in the promotion of Natural Science. Nor, again, so long as such little discrimination is exercised in the distribution of these officers. Curiosity has prompted inquiries which have elicited anything but satisfying discoveries. We find men with talents for one branch of natural history stationed in departments where their particular talents cannot be utilised; recent zoologists in the geological department, palæontologists in the recent botanical one, and men peculiarly gifted for literary pursuits and without the slightest taste for scientific research, in the former. Taking next the department of Recent Zoology, the inadequacy of the present staff and the ill-proportioned attention that is devoted to particular sections, to the entire neglect of the remaining ones, are painfully apparent. In the Vertebrate division, though abundant room for improvement, there is not so much cause for censure; but on descending to the lower and far more bulky one of the Invertebrates, what do we find? Of a staff of five, two are conchologists, and the remaining three entomologists, while the Crustacea, Arachnida, and the whole of the old group of the Radiates, including the Echinodermata, Mollusca, Coelenterata, and Protozoa, are left to shift for themselves, and make way for the necessities of the others. Have we no men in England capable of superintending the arrangement of these neglected classes? or is it that the present remuneration for scientific work, for all but those highest in authority—so slender as to necessitate their utilising every leisure hour in eking out other means of subsistence, and taxing their brains, to the detriment of the amount of work discharged in official hours—deters them from coming forward? At any rate, the evil should be attended to, and the present glaring incongruities abolished. Whether new buildings are erected at Kensington, or the existing ones enlarged, it is absolutely incumbent that the administration shall be thoroughly reorganised. A permanent committee of some dozen eminently scientific men should supply the place of the present host of uninterested trustees, and the staff of officers should be distributed in accordance with the plan adopted in the Paris and various Continental Museums. Each zoological section should have its superintendent, with a number of assistants varying according to its requirements, while one governing mind should assume the responsibility and direct the machinery of the whole; and until such reformation is accomplished, there is no hope of any practical improvements. We do not see why the two large wings of the present establishment, now occupied as residences by the superior officers, should not be converted into exhibition rooms; space enough being reserved for one official residence on either side; and if necessary, additional suitable ones might be rented in the immediate neighbourhood, and the collections thus saved the unavoidable wear and tear of removal, and at the same time preserved in their present convenient position of access to the general public. But the exodus has been decided upon, and the question itself is of secondary importance compared with that of administration. On a future occasion I would direct attention to a few other points.

BATHYBIUS

Steam Lifeboats

THE *Globe* of Friday last contained a report of the proceedings of the Committee of the Steam Lifeship Fund, from which it would appear that the subject of the construction of a steam lifeship is seriously contemplated. As one who has for several years given great attention to this most desirable object, perhaps you will allow me to give the results of my labours.