THURSDAY, APRIL 9, 1891.

ANOTHER DARWINIAN CRITIC.

On the Modification of Organisms. By David Syme. (London : Kegan Paul, Trench, and Co.)

THIS little book is one of a class that was more common twenty years ago, when any acute literary critic thought he could demolish Darwin. Mr. Syme has, however, the advantage of having read some of the best works both for and against Darwinism, and is thus able to support his views by quoting writers of eminence. He begins boldly. In the table of contents of the first chapter we find such headings as, "A fatal admission—Darwin's definition misleading—Refutes his own theory." But when we look for the proof of these statements we find they rest on misconception, misrepresentation, or misquotation. A few examples will show that this is the case.

At p. 3, after quoting Darwin's definition of natural selection as "The preservation of favourable individual differences and variations, and the destruction of those that are injurious," Mr. Syme remarks: "Natural selection is therefore another name for the struggle for existence, and I cannot help thinking that the latter is much the better expression of the two, being less ambiguous." What are we to think of a critic who thus, at the very outset, misrepresents his author, by stating without qualification that of the three factors which lead to natural selection—rapid multiplication, heredity with variation, and the struggle for existence—the first two may be left out of consideration, and the last taken by itself as synonymous with the resultant of the whole? And this misrepresentation he makes use of again and again in his argument. At p. 8 he tells us that "Darwin never acquired the art of using precise language"; and, after quoting some of his statements, adds: "Had he substituted for natural selection the expression 'struggle for life,' there would, it is true, have been less novelty about it, but there would also have been less liability to error, both on his own part and on the part of his readers." And now, having repeated his own erroneous definition twice, he seems to have convinced himself that it is Darwin's also, for he says, in the same paragraph: "We have seen that he defines natural selection as 'the struggle for existence,' and again as 'the survival of the fittest.'" Mr. Syme actually gives both these terms between inverted commas as if they were Darwin's own words, and then goes on to show that elsewhere he speaks of the two as different things; and concludes by informing us that "Such inaccuracies of expression occur in almost every page of his writings"!

One more example of this system of criticism. At p. 10, after quoting a passage from Darwin about the origin of the eye, and of organs used only once in a lifetime, as within the power of natural selection, the critic goes on to say: "It is evident that we have here two kinds of natural selection. We have a natural selection which selects or preserves only, and we have another which adapts, modifies, or creates"; and then there is a quibble about the two being fundamentally different. But what we have to observe here is the word "creates," which Mr. Syme has brought in with an "or," and which he very soon imputes to Mr. Darwin himself. For example, at p. 15, he says: "in other places he insists that variations are created by natural selection"; and again at p. 17, he says:—"We have seen that Darwin has put forth two distinct and contradictory theories of the functions of natural selection. According to the one theory natural selection is selective or preservative and nothing more. According to the other theory natural selection creates the variations, and we are left to infer that it afterwards selects them." He adds that Darwin evidently favoured this latter view, and therefore he (the writer) "shall assume that it is a creative as well as a preservative and destructive process"!

Having thus, by means of various misconceptions and misquotations, shown his readers how inaccurate, illogical, and inconsistent Darwin often is, Mr. Syme surveys the position from his own superior stand-point, and points out the road over which he is about to lead them in a passage which, for its amazing statements and supreme self-confidence, deserves to be quoted.

"I venture to dissent altogether from Darwin on the question of the functions and tendency of natural selection. I maintain that natural selection does not create the favourable variations, at all events in the sense understood by him, and that it does not even preserve them. I go further than this, and assert that it does not even exterminate the unfavourable variations. I shall endeavour to show that it is neither creative, preservative, nor greatly destructive; that it neither produces nor preserves the fit, nor exterminates the unfit, and that, so far from being beneficent in its operation, as Darwin and his followers represent, the struggle for existence is, on the whole, pernicious, and tends to produce disease, premature decay, and general deterioration of all beings subjected to its influence."

How Mr. Syme establishes all this must be studied in the pages of his book. He appears to satisfy himself, and may perhaps satisfy such of his readers as know nothing from any other source of the subjects he discusses. Those who have such knowledge may estimate the value of Mr. Syme's teaching by his explanation of mimicry, which is, that natural selection has nothing to do with it, but that insects choose environments to match their own colours. He tells us that these extraordinary resemblances only occur among insects that are sluggish, and that, "to account for these likenesses to special objects, animate or inanimate, we have only to assume that these defenceless creatures have intelligence enough to perceive that their safety lies in escaping observation."

In a similar manner he deals with the supposed adaptations of flowers for cross-fertilization by insects. After quoting from Darwin the curious mode in which *Coryanthes macrantha* is fertilized by bees, he says that it is "utterly incredible" that this complex arrangement has been provided for the purpose of securing cross-fertilization, adding: "It is far more probable that the insects made use of the existing apparatus than that it had been expressly provided for them in order to get the alleged purpose effected." What use it can be to the insect to be imprisoned in a floral water-cistern he does not deign to explain: neither does he tell us how the flower comes to possess this complex structure. Topsy's explanation, that "it growed," is perhaps thought sufficient.

But though Mr. Syme believes that he has utterly smashed Darwinism, he still professes himself an evolutionist, and in his last chapter gives us an alternative theory in the intelligence of the vegetable and animal cells.

"They are," he says, "the sole agents employed in the construction, and afterwards in the maintenance, of the most complex organisms, and their economic and social organization is both comprehensive and complete. When an injury occurs to any part of the organism, they collect in force on the spot for the purpose of effecting repairs, which they execute with singular skill and judgment, varying the means employed according to the circumstances of each particular case."

This theory will be found much more thoroughly as well as more amusingly set forth in Mr. Samuel Butler's "Life and Habit"; but, whatever may be thought of its merits, few evolutionists will accept it as a complete and sufficient substitute for the Darwinian theory of natural selection.

Mr. Syme has a considerable reputation in other departments of literature as a powerful writer and acute critic; but he has entirely mistaken his vocation in this feeble and almost puerile attempt to overthrow the vast edifice of fact and theory raised by the genius and the life-long labours of Darwin.

ALFRED R. WALLACE.

METALLURGY.

An Introduction to the Study of Metallurgy. By Prof. W. C. Roberts-Austen, C.B., F.R.S. (London: Charles Griffin and Co., 1891.)

THE well-known efforts of Prof. Roberts-Austen in leading students to appreciate the application of correct principles to the metallurgic art, led to high expectation when the publication of his "Introduction to the Study of Metallurgy" was announced, and this expectation has not been disappointed. Although, as regards minute and accurate description of detail and general thoroughness, the volumes of Percy stand alone, and although more condensed works, such as Phillips and Bauerman's "Elements of Metallurgy," are available for the student, yet there has been a distinct want of a systematic exposition of the general principles of metallurgy, and of clear statements as to the physical characters of metals and alloys. These are more especially needed by students on the threshold of metallurgy, who desire to enter profitably on the study of the more or less disconnected details of the art as applied to the several metals, such as are to be found in the monographs of Sir Lowthian Bell, and of the late Sir William Siemens. The evident purpose of the volume is to meet this want, the author having deliberately subordinated details of smelting operations, in order that he might deal at length with the physical properties of metals and the constitution and characters of alloys, modified as these properties often are by thermal treatment, and by the presence of small quantities of foreign elements. Such questions are treated with much wealth of research, and abundant reference to authority. The book will hardly be popular with the class of students who merely attempt to "cram."

The importance of the amount of impurity, which may either be valuable or prejudicial, in the application of metals and alloys in the arts, is strikingly shown by the aid of elaborate curves, among which may be noticed one indicating the influence of minute proportions of phosphorus on steel (p. 24), and others showing the action of nickel on iron, and of foreign elements on gold. A remarkable example of the effect of minute variations in the proportions of an added element is noted (p. 117) in the case of die-steel, which when containing 0·8 per cent. of carbon, may be made into dies that will strike 40,000 coins each, but which would be rendered practically useless by variations of under 0·2 per cent. of the carbon.

In noticing the special section of the work comprised in the first four chapters, the evidently strong points of the author should not be overlooked. He rightly regards it as of much importance that the student should be made conversant with the observations and works of the early metallurgists, with the reasoning which led to their practice, and with the advances which have, up to the present day, resulted from their labours. The treatment of metallurgy, as embodied in this section, is a novel feature, and must have involved much more labour and research than would at first sight be gathered from the fact that it has been possible to compress the conclusions into little more than a hundred pages. In the adoption of this treatment, the author has marked out for himself a course that cannot be too highly commended. The student will now be able to attack with advantage the difficulties he will have to grapple with later, and to discount erroneous statements and false reasonings, which, if presented under the guise of authority, prove to be veritable stumbling-blocks in practice, until the stern school of experience teaches better things.

Metallurgical processes are not treated in the detail usual in metallurgical text-books, and here the essential character of the author's method comes into prominence. Furnaces and apparatus, though classified and illustrated in the previous chapters, hardly appear again, but the general scope of metallurgical procedure is exemplified by means of typical processes, and these occupy thirty-five pages.

The classification of processes (pp. 238–241) well deserves praise. It presents to the student, in a few pages, and in a way not be found elsewhere, the essential and distinctive characters of the whole of the methods of metallurgy, whether by "dry" or furnace processes, by the solvent action of mercury, by solution and precipitation (the so-called "wet" processes), or by the latest and already important methods which involve electrolysis. The more typical of these have been selected for descriptions, which are illustrated by the aid of diagrams showing the essential steps and sequence of operations. By the aid of these diagrams, the student has clearly presented to his eye such excellent but apparently complicated processes as the smelting of copper ores by the Welsh method (p. 242), and the Freiberg method of smelting complex ores (p. 250), which have hitherto been found very confusing, even when the descriptions have been very carefully written. With such guidance, the details of furnaces, of successive roastings and fusions, as fully elaborated in other works, can be studied without confusion or difficulty.