LETTERS TO THE EDITOR.

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The Utility of Specific Characters.

IN a recent issue of the *Journal of the Linnean Society* (Zoology, No. 172) there is a short paper by my friend Dr. St. George Mivart, in which he gives numerous cases of species of Lories peculiar to various Papuan or Pacific Islands, which differ in some details of coloration from allied species in other islands, while they are usually altogether unlike the other birds inhabiting the same island. He then argues, as Captain Hutton had done with regard to similar phenomena among the fruit pigeons of the genus Ptilopus, that these various specific markings cannot be useful, and especially that they cannot be needed as "recognition-marks," because the whole coloration of the genus is so distinct that they cannot possibly be confounded with any other birds now inhabiting the same islands. He therefore concludes that these facts "are fatal to a utilitarian explanation of the origin of all specific characters." At the same time he accepts evolution and the natural biological origin of these and all other characters. These conclusions appear to me to be wholly illogical and to be reached by omitting to take account of the fundamental idea of organic evolution itself, namely, that each species has been, somehow, developed from an allied but distinct species, living or extinct. I therefore ask leave to point out how this omission affects the problem.

It is quite clear then that each distinct species of lory or fruit pigeon now found isolated from their allies in so many of the Pacific Islands *must* (if evolution is admitted) have originated by modification from some other parent species. The modification may have occurred in another island (or continent) or in the island in which the modified species now exists; but, in either case during the process of differentiation, recognition-marks would be of vital importance by checking intercrossing, so much so that it is doubtful whether in many cases the required structural or physiological modifications could be brought about without them. I do not remember that this proposition has been seriously denied, and it is the omission to take account of it that invalidates the argument of Dr. Mivart and Captain Hutton, founded upon the existing distribution of the species in question.

Perhaps these gentlemen will reply that they hold the views of Romanes and Gulick, that the specific differences in question are the direct result of the action of changed conditions on the progeny of the individuals which first reached the islands; but this theory is a pure assumption in support of which I am not aware that any adequate facts or observations have been adduced, while such changes in *all* the individuals exposed to the influence of the new conditions is entirely opposed to the known facts of variation. Supposing, however, that the existing species originated in the islands where they now occur by modification of some two or more original immigrants, let us consider *how* the change would be effected in accordance with the known facts of variation and natural selection.

The first thing that happens on the introduction of a new form into an island well-suited to it, and with no other enemies than those to which it is already adapted, is to increase rapidly till the island is fully stocked—witness the rabbit in Australia, New Zealand, and Porto Santo, the sparrow in America, and numerous other cases. But as soon as the island is fully stocked and all future increase dies off annually, natural selection begins its work, and the least adapted to survive, in every stage from the egg to the parent birds, get destroyed by some means or other. Now, if this process of elimination is identical in character with that to which the species was subjected in its former home no specific change will take place, because the whole structure and habits which constituted "adaptation to conditions" in its former habitat are equally effective in its new abode. But if there is any difference in the environment which requires a new adaptation, whether as regards food, seasons, diseases, or enemies of other kinds, then natural selection will certainly tend to bring about that new adaptation, and as in such a limited area local segregation will be ineffective, some external indication, marking off the new and better adapted from the old less adapted type, will be of the first importance in the prevention of inter-crossing and thus hastening the process of complete adaptation; and these external indications are what I have termed "recognition-marks." When the new type is fully established and the old parent-form has died out, the work of these recognition-marks will have been done; but having been established by a severe process of selection they have become fixed and continue to form the "specific character" distinguishing the new from the old species. The repeated statement of Dr. Mivart, that in this or that case the peculiar marking cannot be a recognition-mark, or that such "recognition-marks" are quite needless, is therefore beside the question, since the very existence of the new species during the process of differentiation may have depended upon them.

I have here confined myself strictly to the one point raised by Dr. Mivart and Captain Hutton, having already dealt with the general question of "utility" elsewhere.

ALFRED R. WALLACE.

The Duke of Argyll and Mr. Herbert Spencer.

IN his review of the Duke of Argyll's "Organic Evolution Cross-examined, &c.," Prof. Meldola describes the Duke as "doing violence to Huxley's teaching," and asks him "in fairness" to "reperuse" something Huxley has written. After recognising the unfairness he refers to, he might not unfitly have suspected unfairness in the Duke of Argyll's representations of my views: especially considering the absurdities ascribed to me. Yet Prof. Meldola says that the Duke "makes some good points out of Mr. Spencer's change of view with respect to the efficiency of natural selection," and represents him as making merry "over Mr. Spencer's abandonment of that excellent child of his creation, the term 'survival of the fittest.'"

Had Prof. Meldola looked into the matter, he would have found that I have in no degree whatever abandoned the term "survival of the fittest." The Duke of Argyll has misrepresented me in a way which is extremely surprising. In the "Factors of Organic Evolution" ("Essays," i. 429-30), after pointing out that the metaphorical character of Mr. Darwin's expression "Natural Selection" is apt to mislead, as he himself admitted, I said that "kindred objections may be urged against the expression 'survival of the fittest.'" I said that "survival" "suggests the human view of certain sets of phenomena" rather than the view of them as physical facts; and I further said that "If a key fits a lock, or a glove a hand, the relation of the things to one another is presentable to the perceptions. No approach to fitness of this kind is made by an organism which continues to live under certain conditions" (p. 430). But there is no admission that the words, imperfectly adapted as they are, fail to express the truth in question with approximate correctness. Any one who will turn to the chapter on "Indirect Equilibration," in vol. i. of the "Principles of Biology" (§ 164), will read as follows:—

"That is to say, it cannot but happen that those individuals whose functions are most out of equilibrium with the modified aggregate of external forces, will be those to die; and that those will survive whose functions happen to be most nearly in equilibrium with the modified aggregate of external forces. But this survival of the fittest implies multiplication of the fittest, &c."

It was in this place and in this manner that the expression "survival of the fittest" arose, and to show that I have abandoned the belief it formulates it is needful to show that I have abandoned the theory of indirect equilibration which it is used to express briefly. I have done nothing of the kind, and there is no sign that I have done anything of the kind.

I am, indeed, not a little astonished that the Duke of Argyll should have reproduced these statements of his after the direct contradiction given to them in my reply to him published in the *Nineteenth Century* for February 1888. At the close of my article, entitled "A Counter Criticism," there occur the sentences:—

"On one further point only will I say a word, and this chiefly because, if I pass it by, a mistaken impression of a serious kind may be diffused. The Duke of Argyll represents me as 'giving up' the 'famous phrase,' 'survival of the fittest,' and wishing 'to abandon it.' He does this because I have pointed out that its words have connotations against which we must be on our guard, if we would avoid certain distortions of thought. With equal propriety he might say that an astronomer abandons the statement that the planets move in elliptic orbits, because he warns his readers that in the heavens there exist no such