THE DIRECTION OF THE HAIR IN ANIMALS AND MAN

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WALTER KIDD

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BY

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PREFACE

THE purpose of this work is threefold. It seeks to co-ordinate the scattered facts of the direction of the hair in the lower animals and man, to furnish interpretations of most of them on mechanical principles, and to supply an answer to the question, "Can acquired characters be inherited?" It is shown that with few exceptions the hair-streams grow on the animal body *in the lines of least resistance*, and the "resistances" encountered are mechanical. No doubt many of the phenomena here described are intrinsically uninteresting and unimportant. As part of a page of natural history they might never have been recorded. But natural history may become natural science, and until it has done so it has failed to fill its place in the order of Nature. When it is seen that the object here kept in view is the establishment of a fragment of *abstract* truth, many, whose horror of theory is genuine and, perhaps, not unreasonable, may be deterred from further interest in it. But others would prefer to help in laying one stone which shall be hidden in the foundations of the fabric of science than many a course of finer blocks in her rapidly-rising walls. If it be objected that the matters here dealt with are

too trifling to be allowed to weigh in a great outstanding controversy, it may be pointed out that if the mere possibility of the transmission of acquired characters be established, such a truth cannot remain ultimately sterile. In unsolved scientific problems the Experiment of the Finger Post is often a trivial one. If we want a parallel for the interdependence of theory and practical results, a page of naval history supplies one. In the middle of the eighteenth century a Scotch gentleman named Clerk of Eldin, was occupying his mind and wasting his time, as his friends thought, in showing by means of models which he called his "wild-ducks" that the naval tactics of the day were radically wrong. He wrote a book on the subject, which evidently fell into the hands of Rodney or his captains, or both, before the memorable Battle of the Saints in 1782. For the first time in naval warfare Rodney dared to "break the line" and the traditions of naval tactics once for all, with the immediate result of which we are aware, and the ulterior results which issued under "the headlong and yet well-calculated fighting" of Hood, Jervis, and Nelson. Anything more abstract, or even visionary, than the work of Clerk of Eldin, and more practical than its outcome in 1782—and after—can hardly be suggested.

It is obvious that if any considerable proportion of the second division of the subject be recognised as valid, an affirmative answer to the question, "Can acquired characters be inherited?" follows as a matter of course. If as much as this be gained, it will remain for others, more qualified to do so, to show how far Lamarckism must rank in future

among the primary factors of organic evolution. The question at issue is one for inductive study rather than for dialectics, and this is the line that has been pursued here. The ultimate importance of it none can doubt. Romanes, indeed, went so far as to say regarding it that an examination of Weismannism in which the question of the transmission of acquired characters is omitted must prove a case of Hamlet without the Prince of Denmark. It forms an integral part of a great system of heredity invented by a greater biologist, and elaborated during a period of nearly twenty years. But it is being felt by many that the teaching of Weismann is exercising an undue influence over contemporary opinion in this matter, so much so that he and his followers can but tacitly acknowledge, in regard to the principle of selection, "we are contending for our all." Their attitude is no less lofty than that of Montrose, when he wrote:

> As Alexander I will reign
> And I will reign alone,
> My thoughts did evermore disdain
> A rival on my throne.

Weismann's theories of heredity were not taken up with any apparent intention of modifying the current theory of evolution, but Romanes showed how intimately associated are the two matters, and it is becoming clear to many that "evolution according to Weismann" is untenable, from which it will eventually appear that its basis, viz., his theory of heredity, will have also to be surrendered. He made some very double-edged remarks as to the "working hypothesis" of the Lamarckian principle in one of

his latest works:* "A working hypothesis may be false, and yet lead to further progress; that is, it may constitute an advance to the extent of being useful in formulating the problem and in illuminating paths that are likely to lead to results. But it seems to me that *a hypothesis of this kind has performed its services and must be discarded the moment it is found to be at hopeless variance with the facts.*" (Italics not in the original.)

I have to thank the Publication Committee of the Zoological Society of London, the Editors of the *Journal of Anatomy and Physiology*, the Committee of Management of the Anatomical Society of Great Britain and Ireland, and the Editor of *Knowledge*, for permission to reproduce here portions of the letterpress and illustrations of papers published by them.

The illustrations have been prepared for me by Mr. R. E. Holding, and have been throughout made diagrammatic, artistic considerations being sacrificed for the sake of clearness. In many of them arrows have been used to represent the hair-streams of the parts, and have been distinguished from one another according as the shafts of the arrows have single, double, or triple feathers, on a certain principle referred to in Chaps. I. and V. This account of a large subject can only be considered as an introduction. To have given detailed descriptions and illustrations of the immense varieties in the arrangement of hair which are found among hair-clad Mammals would have been confusing and unnecessary at this stage, and with the present purpose in view.

* "Germinal Selection," p. 17, 1896.

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