

## LETTERS TO THE EDITOR.

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## Acquired Characters and Stimuli.

DR. ARCHDALL REID is usually so luminous in his statements concerning heredity that I hesitate to express my disagreement with what he has written in NATURE of February 29, and elsewhere previously, as to the use of the term "acquired characters." It is, of course, true with regard to this term, as with regard to a great many others, that it can be interpreted to mean what its original user, namely, Lamarck, did not mean. But I cannot see that anything is gained by so doing. On the contrary, in such cases it seems to me best to endeavour to keep the term for what its introducer meant by it. I also fail to see any advantage in grouping together the various necessary chemical and physical environments of a living thing under the word "stimuli." They do not become changed in nature by the application to them of that term, which is customarily used with more limited application.

It is, of course, true (and I should suppose thoroughly familiar to every biologist) that the reproductive germ of an organism unfolds or "develops" in response to the action upon it of certain surrounding conditions—its environment. When those conditions are "normal," a normal germ develops in response to them—the normal characters of the species. When the conditions to which the young organism is exposed are in some limited degree and in regard to certain ascertainable factors abnormal, the organism develops (in some cases) one or more abnormal characters differing from those developed by an otherwise equivalent specimen retained in the normal environment. The new character or characters developed in response to the abnormal environment (which we assume to be allowed to act on the growing young organism only, and not on its parents) are called by Lamarck—and by those who wish to discuss Lamarck's theory—"acquired characters" (*changements acquis*). The word "acquire" is used to mean "something added to" or "changed in" the normal form of the species.

It is not, I think, permissible to say that the normal characters which arise in response to normal conditions are with equal fitness to be described as "acquired." Of course, all the characters successively developed by a growing reproductive germ or young organism may be spoken of as "acquired" by the organism during its growth from extreme youth to age. But to do so when discussing Lamarck's theory is deliberately to create confusion. The thing in addition to and upon which "acquirements" are made is, in Lamarck's use of the word "acquire," not the growing individual, but the normal specific form as exhibited in normal individuals. That, I take it, is Lamarck's meaning, and it is that which I and others have for more than twenty-five years accepted. I am sorry to say that to use the word "acquired" at this period of a historical discussion, in another sense, is what an unfriendly critic (which I am not) would call "quibbling," and, moreover, quibbling without any discernible object or purpose.

I should like once more to point out (as I did many years ago in a similar correspondence in these pages) that the measurable factors of the normal environment of a species of plant or animal often exhibit within that normal limit a great range in quantity

and intensity. This range differs in different species and groups of organisms, but, as a rule, the normal specific form is developed under conditions which are not very closely limited. A species is usually so "wound up" (to use a metaphor) as to be stable under a wide range of conditions. Outside that range we find first a zone or area of excess or decrease of one or more factors of environment, such as heat, light, moisture, mechanical pressure, chemical character of food, &c., within which the organism still flourishes whilst giving new or abnormal responses to the new and abnormal quantities of the environmental factors. These responses are Lamarck's *changements acquis*—our "acquired characters"—characters which are not those of the species when existing in the by no means narrowly limited range of factors which are its normal environment.

Beyond this zone or area of potential (or tolerable) environment with its corresponding potential development of acquired characters not normal to the species in normal environment, we come to a further zone of larger increase or decrease of environmental factors. Here the organism does not respond as a living thing; it has no reserved potentialities which are called into activity by this further increase or decrease of one or more of the factors of the environment; the environment has become impossible or destructive, and the organism ceases to live.

It is important to distinguish these three zones of limitation in increase or decrease of factors of the environment for every species, the normal, the potential, and the destructive. It is a necessary part of bionomic inquiry to determine the range plus and minus of the several factors of each quality of environment—normal, potential, and destructive—in regard to whole series of species of both plants and animals.

E. RAY LANKESTER.

Bournemouth, March 9.

## Coordinated Purchase of Periodicals in two Newcastle Libraries.

IN 1905 Dr. Thomas Muir read a paper before the Royal Society of Edinburgh entitled "Library Aids to Mathematical Research," in which he urged that unnecessary duplication in the purchase of periodicals should be avoided by adjacent libraries. The matter has been taken up in NATURE, e.g. in vol. lxxxvii., p. 222. The following brief account of what is being done in this regard in Newcastle-upon-Tyne may therefore be of interest.

In 1908 representatives of several Newcastle institutions met in the Public Library, at the invitation of the public librarian (Mr. Basil Anderton), to consider whether any coordination could be effected as regards the purchase of certain learned societies' journals and some of the more expensive and less used periodicals. Armstrong College was represented by Profs. Bedson and Jessop. Prof. Duff, who had for a considerable time manifested cordial sympathy with the project, was unavoidably absent from the meeting. In the course of discussion various journals were named in regard to which concerted action seemed desirable, but for one reason or another, while the principle was commended, only the representatives of the Public Library and Armstrong College were at the time ready to take practical steps in the matter.

Prof. Jessop moved that a beginning be made with certain mathematical journals, and that of those that were being bought in duplicate (one by each institution) some be discontinued, and that the money so set free be applied to the covering of fresh ground. The suggestion, as modified by discussion and finally moved by Prof. Jessop, was approved, and the public