

adjustment," nor any amount of change as to "shape," deserves to be regarded as "any important result"? Must we not rather conclude that when he first wrote upon "the state of panmixia," he had not sufficiently considered the subject; and, in now endeavouring to trim, ends by contradicting himself?

The only issue being as to whether panmixia is itself a cause, or merely the precedent condition to the occurrence of a totally different cause, nothing more remains to be said. As a result of his further consideration, Prof. Lankester now admits "it is clear" that, "without economy of growth," panmixia is a cause of degeneration where "shape" and "structure" are concerned. And, when he considers the matter a little more, he will doubtless perceive the contradiction in saying that, where degeneration as to "size" is concerned, "it is absurd to attribute the result, or any proportion of it, to the panmixia or cessation of selection alone." Variations round an average mean occur in "size" or "bulk," just as they do in "shape" and "structure": therefore, if on this account panmixia is conceded to be a true cause of degeneration as regards the latter, it must likewise be so as regards the former. The fact that in the former case—as I showed in 1874—it must always be more or less associated with the economy of growth, is no proof that it then loses its due "proportion" of causal agency; while, with the now single exception of Prof. Lankester, everyone who has since written upon this "principle" takes the same view as I did—viz. that the phenomena of "dwindling" in our own domesticated animals furnish as good evidence of the operation of panmixia as is furnished by the other forms of degeneration to which he now alludes. Therefore, if he really believes it is in this case "absurd to attribute the result, or any proportion of it, to the panmixia," he becomes opposed, not only to me, but to Galton, to Weismann, to Poulton, and to everybody else who has ever considered the subject. In short, it is now a matter of general recognition that what he calls my "unreal separation between 'cessation of selection' and 'reversal of selection,'" is a separation so fundamentally real, that it is the means—and the only means—of abolishing the evidence of Lamarckian factors where this once appeared to be most conclusive; seeing that "with highly-fed domesticated animals *there seems to be no economy of growth, nor any tendency to the elimination of superfluous details.*"¹

April 19.

GEORGE J. ROMANES.

IN NATURE of April 3 (p. 511) Mr. Herbert Spencer suggests an interesting subject for discussion on the effects of use and disuse of organs, asking for an explanation on the theory of panmixia of the well-known tendency of domesticated animals to droop the ears. Many of the ruminants in a wild state have their ears set on horizontally with an inclination to droop; for instance, the gnu, sable, antelope, zebu, gaur (Central India), Cape buffalo, &c. The American bison has completely drooping ears; there is also at the Natural History Museum, South Kensington, in Case 57, a specimen of a smooth-haired sheep from Turkey in Asia, *Ovis aries*, which has dependent ears. Pathologically, though as yet not physiologically proved, the discussion of the transmission of acquired characters possesses a deep interest.

Evolution seems impossible without variation, and until the latter can be explained on other grounds than those of the inheritance of accumulated minute changes in character acquired through ages of slowly varying climate and conditions of life, preserved by natural selection, this transmission would seem a reasonable conclusion so long as the characters acquired were of service to the inheritor in the struggle for existence.

Though Weismann disbelieves most of the evidence Darwin collected on heredity, and doubts the possibility of the communication of external influences by the somatic cells to the germ cell, he suggests no other hypothesis to account for the phenomena of change, beyond the vague expression "predisposition of the germ-plasm."

R. HAIG THOMAS.

April 5.

¹ Darwin, "Variation, &c.," ii. p. 289. Seeing the importance of "the idea of panmixia" in this connection, I must still be permitted to regard it as "unfortunate" that it was not present to Mr. Darwin's mind before the publication of his last edition of the "Origin of Species." But this does not mean, as Prof. Lankester "affects to suppose," that I regard the unfortunate nature of such a circumstance as due to the fact that I happened to be the first who perceived it. One can only assign so petty a form of "badinage" to the same argumentative level as "pointing out the oversight" that in my first letter I "committed to credit Mr. Darwin with the recognition of the economy of growth." Prof. Lankester has committed about as grave an oversight in his own letter, by omitting to credit Mr. Darwin with the recognition of natural selection.

The "Rollers" of Ascension and St. Helena.

YOU probably know that the United States Scientific Expedition under Prof. Todd has had occasion to stop here during the past two weeks. I have resided during this time continuously at the signal station on Cross Hill (altitude 870 feet), studying the clouds and winds with many important results. I have had an excellent opportunity to observe the "rollers" for which Ascension and St. Helena are famous, and I have been able to demonstrate convincingly to myself their nature and origin. I should be obliged to anyone who will tell me whether my following views have perhaps been arrived at by previous observers.

The south-east trade blows with very various intensities over different parts of the South Atlantic, and the regions of light trade, no trade, fresh and strong trade, vary from day to day, as shown by comparing the logs of vessels. A limited region of strong south-east trade is a region whence spreads in all directions the corresponding strong south-east swell of the ocean surface—very distant storm winds or very near regions of high south-east winds produce similar results on the ocean swell: the locality of these winds will determine whether any point shall be experiencing a light or heavy swell. What causes the variations in the south-east trades, and in what direction the regions of strong trade move, are questions for further study. My present data would show that these latter regions move against the trade winds, i.e. from Ascension towards St. Helena, but there need be no uniformity in this respect.

Now if a south-east swell surrounds such an island as Ascension it is not directly felt on the lee side, but the long rectilinear swells, that advance faster in deep than in shoal water, are seen from my elevated station to assume the new curved shapes that result from the retardations on the shoals. So that finally in typical cases we have off the lee of the island a series of crossing and interfering swells producing at one point a quiet spot, at the next a double swell and great breakers.

The rollers are a magnificent example of deflection by shoals, and of interference and of composition of waves. Their severity at St. Helena and Ascension is apparently due to the proportions of the dimensions of the swell to that of the islands, just as in the interference phenomena of sound and light everything depends on the size of obstacle and length of wave. I have a number of measures that will, I hope, enable me in the future to give more accurate details, but for the present I can only inquire as to the bibliography of the subject. The correct explanation of the rollers, and of the swell on the West African coast, will undoubtedly lead us to further steps in marine meteorology.

CLEVELAND ABBE.

U.S.S. Pensacola, Ascension, April 2.

Self-Colonization of the Coco-nut Palm.

WITH reference to Mr. Hemsley's note on this subject to NATURE (p. 537), I regret to have to inform him that the two young palms found on Falcon Island were placed there by a Tongan chief of Namuka, who, in 1887, had the curiosity to visit the newly-born island, and took some coco-nuts with him. This information I received from Commander Oldham, who had been much interested at finding these sprouting nuts at some 12 feet above sea-level and well in from the shore of the island, but who found out the unexpected facts in time to save me from making a speculation somewhat similar to Mr. Hemsley's.

W. J. L. WHARTON.

Nessler's Ammonia Test as a Micro-chemical Reagent for Tannin.

IN most cases the presence of tannin is immediately shown by all the ordinary reagents used by the botanist for its discovery. This does not happen sometimes, however; as, for instance, in the tannin-cells found in the epidermis on the dorsal side of the leaves of some plants. As a good typical example the common primrose may be cited. Of all the ordinary tests, including iron salts, potassium bichromate, Moll's test (copper acetate and iron acetate), ammonium molybdate, and osmic acid in 1 per cent. solution, the latter alone acts immediately upon the tannin in the primrose leaf's epidermis. It may hence be worth while recording the discovery of a second reagent capable of acting rapidly and effectively; and one which is easily made and will keep for some time should be especially valuable. Such a reagent is Nessler's test for ammonia.