

LETTERS TO THE EDITOR

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What is "Anlage"?

THE necessity of finding an adequate translation of this indispensable German expression becomes more, rather than less, pressing as time goes on. To be obliged, on every occasion, to write "Anlage" in inverted commas, is a standing testimony to the deficiency of our scientific nomenclature, and a constant offence to our aesthetic susceptibilities. It is true that there are other terms which have been spasmodically employed to convey the conception contained in "Anlage." But these terms are either inadequate, unsightly or inaccurate. "Forecast" is inadequate, "fundament" is unsightly, while "rudiment" is inaccurate. I will not insist further upon the impropriety of the use of the words "forecast" and "fundament," but will proceed to explain why, in my opinion, "rudiment" is an inaccurate rendering of "Anlage." It is not so much that an "Anlage" of an organ is not a "rudiment" of that organ, as that the rudiment of an organ is generally something different from its "Anlage."

This point is best illustrated by considering a somewhat extreme case, or at least one which is a matter of common observation. The budding limbs of the embryo of a quadrupedal vertebrate are rudiments of the pentadactyle appendages which have their origin in the internal "Anlagen" of those structures. Thus the "Anlagen" are aggregations of embryonic cells which, by their growth and division, give rise to rudiments, and the latter, in their turn, give rise to the finished organs. So that, far from being identical with an "Anlage," a rudiment arises from an "Anlage," and is the middle stage in organogeny.

As the organs of the animal body are built up of tissues, and these of cells, so, in their development, they spring from rudiments, and these from "Anlagen."

This analogy may be represented as follows:—

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| <i>Anatomy.</i> | <i>Development.</i> |
| Organs—tissues—cells. | "Anlagen"—rudiments—organs. |

In some cases, no doubt, it would not be necessary to make a fine distinction between "rudiment" and "Anlage," but in others it is undoubtedly necessary; and it is for such cases that one has to be prepared with a suitable technical term.

The essentials of a good term are that it should be new, precise and Latin.

The word that commends itself to me as being at once accurate and well-sounding is *primordium*, and I trust some of your readers will criticise it whether favourably or unfavourably.

The conception embodied in the word "Anlage" recurs so frequently in our science, that it seemed of sufficient importance to invite attention to the matter in the columns of NATURE.

New Museums, Cambridge, ARTHUR WILLEY.
August 16.

"Animal Intelligence."

IN a review of my monograph on "Animal Intelligence," in a recent number of NATURE, Mr. Lloyd Morgan credits me with upholding the theory that we have sensations caused by outgoing currents which innervate muscles, and with depending on that theory in some of my own statements about the nature of animals' consciousness. A careless and ambiguous sentence of mine was responsible for this. I believe with Mr. Morgan that the feelings which go with innervations of the muscles are due to currents coming back from the muscles or joints and tendons, and do not think that any of my conclusions in any way involve an acceptance of the other theory. Such sensations due to return currents (together with the images built up from them) were just what I meant by the phrase which he quotes, "the consciousness accompanying a muscular innervation apart from that feeling of the act which comes from seeing oneself move, &c." It was because I presupposed general agreement in accepting the return-current theory that I was so careless as to leave the obvious ambiguity. EDWARD L. THORNDIKE.

Cambridge, Mass., U.S.A., August 3.

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I NEED hardly say that I sincerely regret the unwitting misrepresentation of Mr. Thorndike's meaning. But I may be allowed to add, in self-defence, that the "careless and ambiguous sentence" forms part of the definition of "impulse," and that the exclusion of "feeling one's own body in a different position, &c.," is emphasised by italics. I am glad to find that Mr. Thorndike's interpretation and my own are thus yet more closely in accord than I supposed, and shall look forward to more experiments and further discussion in the field of "Animal Intelligence" from him. C. LLOYD MORGAN.

A Tooth of *Hybodus grossicornis* from the Inferior Oolite.

SOME time ago I found in one of the lowest strata of the Inferior Oolite, a tooth of the *Hybodus grossicornis*. The bed occurred at Haresfield Beacon, near Gloucester. The following section of this hill is given by Mr. E. Witchell, of Stroud:—

Freestone: Ferruginous concretionary marl, 1 foot 6 inches; ferruginous brown hard sandstone, 8 feet; oolitic ferruginous bed, 2 feet; Cephalopoda beds, 2 feet 6 inches.

Below these beds are the Cotteswold Sands, resting upon Upper Lias. The tooth was found in the freestone bed, the characteristic fossils of which are *Ostrea*, *Lima*, *Terebratula*, various small Gasteropoda and Crinoids.

The species of the fossil has been kindly determined by Prof. Newton.

THOS. BEACALL.

Quedgeley, Gloucester, August 19.

Iridescent Clouds.

YOUR correspondent Mr. W. Larden, writing on the subject of solar halos (p. 344), referred also to rose-crimson and green colours on clouds. It is quite unnecessary to be at 6000 feet altitude to observe iridescent clouds, for we do so frequently here during the summer months, at about 350 feet above sea-level. They appear generally about an hour before sunset and cease at sunset, and we always look out for them when seeing the suitable kind of delicate cirrus cloud in fine wavy fleecy streaks in the sky near the sun at the right hour; and are generally rewarded by the sight of the exquisite rose and green ripples of nacreous brilliancy, affording a striking contrast to the ordinary sunset colouring. E. ARMITAGE.

Dadnor, Herefordshire, August 16.

Distant Thunderstorms affecting Flowers.

AT Malvern we felt none of the thunderstorms of Thursday, August 18, and the following night; but some freshly-cut sweet peas shrivelled, and did not recover their beauty until the morning of the 19th. The nearest storms must have been at Cardiff and Bristol. ROSEMARY CRAWSHAW.

INTERNATIONAL CONGRESS OF ZOOLOGISTS.

THE Fourth International Congress of Zoology, which opened at Cambridge on Tuesday morning, August 23, promises to be the most successful meeting yet held. This is the first occasion that the Congress has met in England, and the proportion of English members assembled to extend a welcome to the foreign zoologists is, as it should be, considerable. The Congress is a triennial one, and has already met at Paris, Moscow and Leyden. The increasing popularity with which the meetings are regarded by zoologists may be gauged by the progressive increase in the number of members attending. Only sixty members were present at the Paris Congress in 1889, 120 at Moscow, and 200 at Leyden; the number participating at the present meeting has already exceeded 280. Among the distinguished visitors present are Dr. Anton Dohrn (Naples), Prof. E. Ehlers (Göttingen), Prof. L. von Graff (Graz), Prof. Haeckel (Jena), Prof. E. L. Mark (Cambridge, Mass.), Prof. O. C. Marsh (New Haven), Prof. A. Milne-Edwards (Paris), Prof. K. Mitsukuri (Tokyo), Prof. Ramsay-Wright (Toronto), Prof. W. Salensky (St. Petersburg), Prof. F. E. Schulze (Berlin), and Prof. J. W. Spengel (Giessen). Much disappointment is felt at the absence through ill