disaster. But during any lengthy period, the species of insects will show fluctuation in the number of surviving individuals, and must from time to time come very near to extinction. Indeed, very many do become extinct, as we can infer from a study of the fossil records. During these recurring 'hard times', slight advantages or disadvantages are of critical importance and may decide between survival and extinction. But at other times of greater prosperity, they seem to be of little consequence. If a 'critical' period occurred once in a thousand years, it would suffice for all the purposes of the theory.

Another important consideration is the frequency of parallel and 'convergent' variation; the continual recurrence of similar structures, patterns and colours in different genera and species. These phenomena indicate the existence of deep-seated tendencies, which find expression without any reference to immediate utility. In this way it often happens that diverse insects, even in different localities, come to look alike, and if 'mimicry' is promoted by natural selection, these resemblances are the raw material on which it works.

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Bilateral Gynandromorphism in Feathers

IN recent publications Lillie and Juhn[1], Domm, Gustavson, and Juhn[2], and Lillie[3], have suggested an explanation of the bilateral gynandromorphism of certain individual feathers. This explanation is based upon the idea that susceptibility to female hormone depends upon growth rate, being greatest for slow-growing and least for quick-growing feather tissue. These authors further describe the formation of the rachis by concrescence. The rachis thus has a double origin, and its two sides were once the two halves of the collar. This description differs widely from the accounts of Strong[4,5] and of Davies[6].

Now it may be remarked that past growth rates can only be measured by the relation of the size of present to past structures, and that present growth rates cannot be measured at all. It would seem, therefore, that the suggestion that in a bilaterally gynandromorphic feather the growth rates on the two sides of the collar were so different that, on the theory advanced by Lillie and his collaborators, female hormone could act on one side and not on the other, can only find a foundation in observation in one of two sets of circumstances. Either (*a*) the barbs on the two sides must be of different lengths, and the rachis curved, since one side of it has grown faster than the other; or (*b*) the feather germ must have an asymmetry of just such a kind and degree as to compensate for the difference in growth rate and give a straight feather. This asymmetry might be in fact a displacement of the ventral growing point from its theoretical position diametrically opposite the forming rachis; then the more rapidly growing side could get carried out of the region of growth so much sooner than the more slowly growing side, having less distance to travel, as to be the same size or even smaller.

The condition (*a*) is certainly not fulfilled in fact. The bilaterally gynandromorphic feathers shown in Figs. 51 and 52 by Lillie and Juhn[1] are straight, as are those figured by Cook, Dodds and Greenwood[7]. The retrices of Bond's pheasant[8] have a curvature which is not in constant relationship to their sexual dimorphism. There remains condition (*b*). Lillie and Juhn[1] figure an asymmetrical germ (Fig. 8), which gives rise to a feather symmetrical in shape, so that by their account its growth must have been different on the two sides. The relationship of colour to growth rate is, however, not shown by this example as the feather is also symmetrical in colour.

While the work of Lillie and Juhn and the other authors referred to is clearly of the very greatest interest and importance, it seems, in the light of the foregoing remarks, that the concept of the formation of the rachis by concrescence may lead to difficulties in the interpretation of sexually dimorphic colours which might be avoided by the adoption of other accounts of feather development, and that growth rate may not play quite the part assigned to it in determining the susceptibility to female hormone of the parts of the feather.

It is hoped soon to undertake work in this Department involving in particular an analysis of the relationship of asymmetry in the germ to asymmetry in the feather, and to review in the light of any evidence gained the physiological principles concerned, whether they be of growth rate, or of differentiation rate, or of a kind not yet apparent.

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[1] *Physiol. Zool.*, **5**, No. 1; 1932.
[2] Section on plumage tests in birds in "Sex and Internal Secretions". Edited by Allen (Williams and Wilkins, 1932).
[3] *Science*, **74**, 387; 1931.
[4] *Bull. Mus. Comp. Zool. Harvard*, **40**, 147; 1902.
[5] *Biol. Bull.*, **3**, 289; 1902.
[6] *Morphologische Jahrbuche*, **15**, 560; 1899.
[7] *Proc. Roy. Soc.*, B, **788**, 286; 1934.
[8] *J. Genetics*, **3**, 205; 1913.

Designation of the Positive Electron

I HAVE been hoping that, following Lord Rutherford's proposal of a name for the heavy isotope of hydrogen, someone would suggest a more satisfactory word than 'positron' for the positive electron. Since, however, no better qualified reformer has appeared, may I raise the question before it is too late? 'Positron' is ugly; it offends literary purists by its hybrid character; and it not only bears no relation to the established name of the associated particle, the electron, but even suggests that that particle should be called the 'negatron', which fortunately it is not.

In order to balance destructive by constructive criticism, I venture to propose the name 'oreston' for the newcomer. The word is euphonious, pure Greek, and since, in one of the most beautiful of Greek stories, Orestes and Elektra were brother and sister, it implies an appropriate relation between the two particles. The name found favour among many physicists in Pasadena where Anderson first obtained evidence of the particle, when I mentioned it there last year. I do not propose, however, further to urge its claims, the purpose of this letter being mainly to cleanse the language of 'positron', and only incidentally to nominate a substitute.

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