Letters to the Editor

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Activity of Crystalline Preparations of Vitamin B_1

IN the same laboratory where thirty years ago Eykman made his famous investigations, Jansen and Donath[1] succeeded in 1926 in obtaining for the first time the antineuritic vitamin in crystalline form, in quantities too small, however, for further study. Five years later, the same results were also obtained by other investigators; almost simultaneously there appeared publications on the same subject by van Veen[2], Windaus and Tschesche[3] and Ohdake[4], whose crystalline products were only slightly more active than that of Jansen and Donath, although at first the contrary was stated[5]. Moreover, all these substances had roughly the same empirical formula, though they had been isolated from different sources —rice-bran and yeast.

This uniformity of results was broken by an announcement of Peters[6] and his collaborators, that they had isolated a still more active product. As a matter of fact, we were able to demonstrate in this laboratory that Peters' substance was about $1\frac{1}{3}$ times as active as our purest product (and also Windaus's). The experiments were made with a kind of rice bird[7]. These rice bird tests, which can only be made in Java (this being the one region where these birds occur), have the advantage that one works simultaneously with ten of these birds, which are very sensitive to a B_1 vitamin shortage and give very constant results. Whereas about 0·5 mgm. of the original preparation of Jansen and Donath was needed to provide ten birds during about 25 days with the necessary B_1 vitamin (not a single case of polyneuritis occurring within 15 days), the necessary quantity of Windaus's and also of our preparation was 0·4 mgm., while of Peters' preparation only 0·3 mgm. was required.

By improvements of our method of isolation[8] applied thus far we have succeeded in isolating a crystalline product, which is about twice as active as our former preparation and then probably also more active than Peters' preparation; namely, 0·2 mgm. sufficient for the rice bird test. Of this preparation a rice bird therefore needs a daily dose of 0·8 γ, a young rat 1·5 γ or a little more. 1 gm. of this preparation is equal in activity to about 500,000 (provisional) international standard units. The crystals are much flatter than those of the less pure preparations; the melting point is about 2° higher. Also its behaviour to different reagents is as described before[5]. The empirical formula is also similar to that of the less pure preparations from this laboratory (C, 40·7 per cent; H, 5·5 per cent; N, 15·7 per cent; it also contains sulphur). Hence it appears probable that the less active preparations contain inactivated vitamin, and the possibility is not excluded that even the most active preparations now obtained still contain inactive substance.

The 'activated clay' from this laboratory (which serves also as the League of Nations standard preparation) is a substance easily prepared in large quantities, and the isolation of the crystalline vitamin is a rapid process. In our opinion it is urgent that the investigation of this important vitamin should be made by numerous laboratories, in order to obtain definite results as soon as possible. We shall shortly publish elsewhere a detailed account of the improved technique for its isolation.

A. G. VAN VEEN.

Medical Laboratory,
Chemical Department,
Batavia.
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[1] *Proc. Acad. Sci. Amsterdam*, **29**, 1390; 1926.
[2] *Recueil*, **49**, 1196; 1930.
[3] *Z. physiol. Chem.*, **204**, 123; 1932.
[4] *Proc. Imp. Acad. Tokyo*, **7**, 102; 1931.
[5] A. G. van Veen, *Z. physiol. Chem.*, **208**, 125; 1932.
[6] *Biochem. J.*, **27**, 232; 1933.
[7] *Meded. Dienst Volksgezondheid*, N. I., **21**, 184; 1932.
[8] *Recueil*, **50**, 610; 1931.

The Unit Character in Genetics

IN his British Association address on "The General Nature of the Gene Concept"[1], Prof. R. Ruggles Gates states that "the conception of the unit character was given up many years ago". It is hard to let this fertile conception go without a word to be said for it, even though it may be ineffectual. If the conception of the unit character is not wholly true in its original connotation, it cannot be wholly false since man himself has been spoken of as a "rational animal", denoting an individual unit of the highest degree of complexity. The cuticular bristles of arthropods are structures of their own kind, that is to say, they are homologous, whether transformed into tactile, olfactory, natatory setæ, supporting spines or prehensile hooks. They may be regarded as units of the first order, although they possess such different potentialities, to which may be added the qualities of position, colour and size.

In the district of Mille Isles, situated in a part of the province of Quebec where the Laurentian Hills begin to sink down to the level plain of the St. Lawrence basin, I have recently picked up from the snow a dipterous insect destitute of its two wings. There are several kinds of 'flies' to be found on snow in late autumn and early spring, but only one of them is wingless, namely, *Chionea*. Through the kindness of Mr. Arthur Gibson, Dominion Entomologist, I have been supplied with a list of Canadian records of *Chionea*. These are few and far between, but they go back to the time of P. H. Gosse (1839). When seen moving with its long legs slowly and somewhat helplessly on the snow, it presents at a distance a spider-like appearance, and the species found in Germany was named *Chionea araneoides*. The wings have simply ceased to be, they have dropped out of existence at a plunge, but the balancers or 'halteres', which represent the hind-wings of the two-winged flies, are maintained in full working order. The wings of a fly behave as a unit, but they have many accessory characteristics, chief among them being the venation. Nevertheless the wings not only function as a unit but in *Chionea* they have also vanished as a unit, while the balancers remain in full force.

The finding of *Chionea* in the flesh is a rare experience not easily dismissed from the mind. The lesson of it is the persistence of vestigial organs, when modified to serve a new function, after the normal organs of flight have disappeared without a trace. There are plenty of flightless female moths lying dead upon the snow at this season; before the