

of the 1893-96 expedition, played a great part in suggesting the correct explanation.

Oceanography has advanced too rapidly in the twentieth century to allow its text-books to include an adequate treatment of historical aspects. It would be a very good thing if a history of the subject could be written, while authorities whose basic contributions have been appearing since late in the nineteenth century can, happily, still be consulted.

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### Biliverdin as a Pigment in a Fish

In *Belone belone*, the garfish, the bones, scales and fin rays are of a bright green colour. The chemical nature of this well-known colouring matter has long remained unknown. It cannot be extracted from the tissues in which it occurs by any organic, or neutral, weak acid or alkaline inorganic solvent. But in stronger bases the green scales show a particularly clear transition to yellow, which can be turned back to green again in acids. In at least ten per cent alcoholic hydrochloric acid, the green colouring matter quickly becomes a blue-green in solution and can be separated with chloroform. It gives a clear Gmelin reaction and shows in its insolubility all the typical characteristics of biliverdin.

Thus, a gall pigment has been found in invertebrates for the first time, together with other pigments, as a colouring matter of the integument.

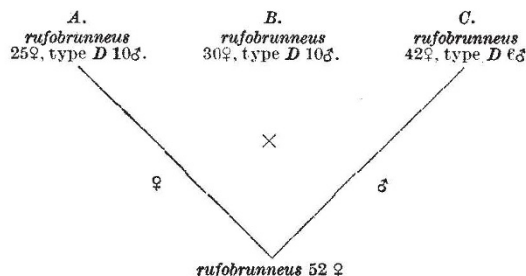
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### Genetics of Woodlice

I POINTED out recently<sup>1</sup> that my last brood of *Armadillidium vulgare* (Latr.), var. *rufobrunneus* Cilge., nearly all died. Of the previous brood, the result of a cross between a female of *rufobrunneus* and a male of Howard's type *D*, I obtained the following interesting result. A brood liberated on October 26 consisted of 40 female *rufobrunneus* and 27 males of type *D*. Most of the male specimens have been consumed by the females of *rufobrunneus*. I secured, however, three females impregnated by one of the males of type *D*, and from these I have obtained three broods. All the specimens appeared to be sickly and most of them died.

Later, I placed a specimen of *rufobrunneus* from the brood *A* with a male specimen from brood *C*. The result was a brood of 52 females referable to the variety *rufobrunneus*, as shown below:



If we compare these two series of experiments (*Nature op. cit.*), and the present record, the following facts seem clear.

(1) That the female of the variety *rufobrunneus* crossed with the male of Howard's type *D* in the first generation produced more females than males; in the second generation, there were more males than females, and in both cases all were referable to type *D*. In the third generation we find no specimens referable to type *D*; all belong to variety *rufobrunneus* and all are females.

(2) In the second experiment, described above the variety *rufobrunneus* dominates in three separate broods and the bulk of the progeny were females, namely, 97 females and 16 males. In the final brood all the specimens were referable to the variety *rufobrunneus* ♀.

(3) It would appear from these experiments that the variety *rufobrunneus* was a dominant form, and while the type *D* makes its appearance, in only one instance did it exceed the number of females.

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<sup>1</sup> *Nature*, 154, 797 (1944).

### Colour and Growth of Hair in Rabbits

HADDOW *et al.*<sup>1</sup> have recently reported that the growth of hair on the rat appears to take place in a series of waves symmetrically disposed about the longitudinal axis. They support this view by studying the disposition of a flavin dye, which, after injection, colours the hair of albino rats in a pattern corresponding to the most rapidly growing hair. They record the areas of regeneration of depilated hair and show that the blood capillaries are most dense in the areas of rapid growth.

Rabbits have been depilated here for many years in order to study either vaccinia lesions or the behaviour of 'diffusing factor' (hyaluronidase). Observations made concerning the growth of hair on the rabbit may be of interest.

Hair growth on the rabbit appears to follow a similar course to that reported for the rat. In rabbits with coloured hair the waves of rapid growth, disposed symmetrically about the longitudinal axis, can be observed on the depilated animal as raised coloured areas varying from about 0.5 to 5 cm. wide and usually stretching from the ears to the hind quarters. Close examination of these areas shows that they are coloured because they contain pigmented hair shafts. When the hair has ceased active growth the proximal half of the shaft is white, pigment being restricted to the distal part. Hence the skin in regions of restricted growth appears white. Varieties of rabbit such as the Flemish Giant have hair, each shaft of which has bands of different colour. These bands always appear in the same order, and hence by noting the colour of the shafts just emerging from the skin an estimate may be made of the direction of the growth wave. The younger hair is always on the ventral edge of the wave, and from this it is deduced that the waves spread from the dorsal to the ventral surface of the animal. In albino rabbits rapid growth of hair seems to occur in raised hyperæmic areas in which the pink colour suggests dilatation or abundance of skin vessels. These areas are 'spongy' if injected with a needle. Hyperæmia and thickening of the skin in these areas of rapid hair growth is always more pronounced on the ventral edge, the whole area appearing as an escarpment facing downwards. In adult animals these waves of hair growth