

43 females and the percentage of males 2.33. Males were therefore more than sixteen times as numerous on cashew as on cacao.

The following, among other suggestions, might be put forward to explain these facts: (1) the production of a greater proportion of males with higher population densities; (2) the differential mortality of the sexes on the two host plants; (3) the physiological effect of the food; (4) the existence of distinct biological races on the two host plants; and (5) cashew, being supposedly more nearly allied to the original host plant than is cacao, supports a population more closely akin to the bisexual gamogenetic form hypothetically present on the ruderal host plant.

The significance of this phenomenon is unknown and no explanation is advanced. It would be interesting to know of any other examples among insects of the sex ratio being similarly affected by the host plant.

E. MCC. CALLAN.

Entomology Department,
Imperial College of Tropical Agriculture,
Trinidad, B.W.I.

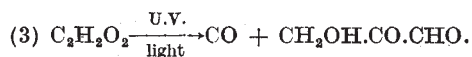
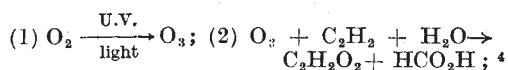
¹ Urich, F. W., Circ. Board Agric., Trinidad, 6-7 (1911).

² Reyne, A., Bull. 44, Dept. Landb., Surinam, 50-52 (1921).

Reductone and Vitamin C

DR. F. WOKES and his colleagues have referred¹ to the chemical similarity of the reductones to vitamin C. The production of reductones by heating carbohydrates with alkali² is incorrectly attributed by them to Norrish and Griffiths, but it may be mentioned that the latter³ obtained a high yield of reductone (hydroxypyruvic aldehyde) by irradiating glyoxal vapour with violet and near ultra-violet light.

Hydroxypyruvic aldehyde, a substance chemically akin to vitamin C and the carbohydrates, can be produced from inorganic sources by the following sequence of reactions:



Such a short series of formally simple reactions may suggest the possibility that traces of reductone might be formed from the gases in the atmosphere without the intervention of a living organism, but this appears highly speculative.

J. G. A. GRIFFITHS.

London, N.14.

July 13.

¹ Wokes *et al.*, NATURE, 152, 14 (1943).

² Dr. Wokes has kindly informed me that the reference should be to Euler and Martius, *Annalen*, 505, 73 (1933).

³ Norrish and Griffiths, *J. Chem. Soc.*, 2829 (1928).

⁴ Wohl and Brännig, *Chem. Z.*, 44, 157 (1920).

Conception of the Tail in the Craniata

THE word 'tail' is used in the anatomy of the Craniata indiscriminately for two concepts: first, for the post-anal appendage, and secondly (especially in osteology) for the post-sacral region. While directing research on the anatomy of the Testudinata and other reptiles for many years past, I have often been struck by the unjustifiability and ambiguity of this usage and the confusion that results from it. Although in many vertebrates the two regions commonly denoted by the term 'tail' may appear to be more or less co-extensive, careful observation reveals that they scarcely ever correspond with each other to such an extent as to be regarded as identical. The anus seldom if ever lies precisely at the hinder level of the sacrum. In some cases (testudinates, crocodylians, etc.) it is a longitudinal slit and may extend beyond the limits of a single vertebral segment, its anterior rim usually lying distinctly posterior to the hind face of the sacral (or the last sacral) vertebra.

In the testudinates, perhaps, the condition is the most remarkable. While the sacro-iliac articulation lies cranial to the posterior border of the carapace considerably within the corselet, the anus occupies a position always outside the shell when the 'tail' is fully extended. Such a position of the anus, markedly posterior to the hind face of the sacrum, is apparently correlated with the functional necessity of discharging the faeces beyond the corselet margin. Thus the two regions commonly connoted by the word 'tail' are here very distinct, as the intermediate region between the sacro-iliac articulation and the anus is fully developed. The post-sacral part is always present although the post-anal region may be more or less atrophied in certain cases.

In view of this disparity in meaning, it may be best to restrict the word 'tail' uniformly to one concept, the post-anal appendage, and apply another word to the post-sacral region. For the latter a suitable term is already available, the 'coccyx' or 'coccygeal region', but its connotation has to be extended from the post-sacral region of the vertebral column to that of the body and it has to be scrupulously adopted to the exclusion of the word 'tail' whenever this region is meant. Thus the so-called 'caudal' vertebrae should be called the coccygeal vertebrae, the 'urostyle' (Gk. *oura*, tail; *stylos*, pillar) the os coccyx, and the loosely designated 'tail' of testudinates the coccyx or coccygeal region. The part of the coccyx between the sacrum and the anus, which is well developed in turtles, may be called the preano-coccyx in order to distinguish it from the post-anal part of the coccygeal region (postano-coccyx), which is equivalent to the tail, *sensu strictu*.

If we accept this nomenclature, the cyclostomes and fishes have a tail, but no coccyx differentiated at all, as the sacro-iliac articulation is lacking. In other words, they form a division of the Craniata which may be called Acoccygea. The coccyx is distinguished only when the sacro-iliac articulation makes its appearance, and this happens in the Tetrapoda, which may, therefore, be designated Coccygeata.

Among the Coccygeata, the amphibians and reptiles, as a rule, have the tail and the coccyx well differentiated, more or less corresponding with each other but never co-extensive. The difference in position between the anus and the sacro-iliac articulation, which is responsible for the variation in