asexual–sexual cycles of varying lengths occurred. Extreme variability in the length of sexual and asexual periods was in fact an outstanding characteristic. Asexual periods varied in length from on› to 97 days; sexual periods varied from one to 103 days.

In summary, although we cannot at present explain the alternating periods of sexuality and asexuality which occur in mass and isolation cultures and at population densities ranging from 0·1 to 2·7 individuals per ml., it is clear that neither crowding nor stagnation is necessary for sexual differentiation to occur.

HELEN D. PARK
CHRISTYNA MECCA*
ANNE ORTMEYER

Laboratory of Physical Biology,
National Institute of Arthritis and Metabolic Diseases,
National Institutes of Health,
Bethesda 14, Maryland.

* Present address: National Institute of Dental Research, National Institutes of Health, Bethesda 14, Maryland.

[1] Loomis, W. F., *Science*, **126**, 735 (1957); *Sci. Amer.*, **200**, 145 (1959); in *Cell, Organism and Millieu*, edit. by Rudnick (Ronald Press Co., New York, 1959). Loomis, W. F., and Lenhoff, H. M., *J. Exp. Zool.*, **132**, 555 (1956).

[2] Daniel, George E., and Park, Helen D., *J. Cell. and Comp. Physiol.*, **38**, 417 (1951); **42**, 359 (1953); *Amer. J. Roent., Rad. Ther. and Nuc. Med.*, **72**, 857 (1954). Park, Helen D., *Biol. Bull.*, **111**, 240 (1956); *Physiol. Zool.*, **31**, 188 (1958).

[3] Park, Helen D., *Anat. Rec.*, **134**, 623 (1959).

The Number of Testis Follicles in Miridae

THE male reproductive system of bugs has been investigated in detail for a handful of species[1] or, in a range of species, quantitative data presented on the testis follicles[2]; but the dominant family in temperate climates, Miridae, has scarcely been examined—probably because of the difficulty specific determination presents to non-specialists.

This communication summarizes details of counts made of testis follicles in 90 of the 199 mirids listed as British[3]. Where the follicles were small, convoluted or otherwise obscured aceto-orcein staining, as in routine bug cytology, was used to aid visualization[4]. The seven species seen by Woodward[2] were re-examined.

The non-British Cylapinae and Palaucorinae—the latter of dubious status and monotypic—make up, with the six sub-families listed in Table 1, the family Miridae, a family the limits of which are not in dispute. Kullenberg believed that, as a rule, mirids have seven follicles in each testis, but this is contradicted by my work. From Table 1 it is seen that follicle numbers range from one to eight, while all sub-families in which five or more species have been examined exhibit a marked modal number, namely: Phylinae 3, Dicyphinae 1, Orthotylinae 2 and Mirinae 7. Such distinction between the groups was unexpected: there are no cases within the Arthropoda, so far as is known, in which this apparently fundamental structure, one in which it is difficult to envisage selective advantage in any of the variants, exhibits such division into compartments at sub-family level.

Table 1. TESTIS FOLLICLE NUMBER IN 90 BRITISH MIRIDS

Sub-family	Species	Follicles
Bryocorinae	*Monalocoris filicis*	2
Deraeocorinae	*Alloeotomus gothicus*	3–4 variable
	Deraeocoris lutescens	2
	D. olivaceus	7
	D. ruber	8
Phylinae	23 species	3
	Oncotylus viridiflavus	4–5 variable
Dicyphinae	5 species	1
Orthotylinae	20 species	2
	Cyrtorhinus caricis	1
	Orthocephalus coriaceus	4?
Mirinae	30 species	7
	Notostira elongata	3
	Leptopterna dolabrata	8
	L. ferrugata	8
	Stenotus binotatus	8

Discussion of the bearing of these facts on the phylogeny of Miridae must await a re-assessment of all the structures now investigated in the family: male and female genitalia[5], chromosome numbers[4], ovariole number[6] and eggs[7], in addition to the traditional 'characters' of the systematist (arolia, pseudarolia, wing venation, pronotal structure, etc.). The results do, however, suggest: that Dicyphinae warrants sub-family status, as has been suggested elsewhere on other grounds[4]; that intraspecific variation—which is accompanied by unilateral variation—is a rare phenomenon, only noted in two of the 90 species examined; that in Orthotylinae the position of certain Halticini, here represented by *Orthocephalus coriaceus*, requires investigation, as suggested on other grounds[5]; that *Cyrtorhinus* may possibly be wrongly placed at present; that it is doubtful whether *Deraeocoris lutescens* on one hand and *D. olivaceus* and *D. ruber* on the other are congeneric; that a follicle number of eight occurs only in groups in which seven is perhaps the usual number.

The diverse results obtained from the four deraeocorines, and that for the single bryocorine, mean little at present; both groups are essentially tropical. The clearest case of wide divergence from a well-defined sub-family pattern is that of *Notostira elongata*, a bug the systematic position of which has never been questioned.

The full list of species will be published elsewhere.

DENNIS LESTON

44 Abbey Road,
London, N.W.8.

[1] Bonhag, P. F., and Wick, J. R., *J. Morph.*, **93**, 177 (1953). Davis, N. T., *Ann. Ent. Soc. Amer.*, **49**, 466 (1956). Kullenberg, B., *Zool. Bidr., Uppsala*, **23**, 1 (1946).

[2] Pendergrast, J. G., *Ent. Mon. Mag.*, **92**, 275 (1956). Woodward, T. E., *Ent. Mon. Mag.*, **86**, 82 (1950).

[3] Southwood, T. R. E., and Leston, D., *Land and Water Bugs of the British Isles* (London, 1959).

[4] Leston, D., *Chromosoma*, **8**, 609 (1957).

[5] Kelton, L. A., *Canad. Ent.*, Supp. **11**, 1 (1959). Slater, J. A., *Iowa State Coll. J. Sci.*, **25**, 1 (1950).

[6] Miyamoto, S., *Sieboldia, Fukuoka*, **2**, 69 (1957).

[7] Southwood, T. R. E., *Trans. Roy. Ent. Soc. Lond.*, **108**, 163 (1956).

Evolution of the Sweet Potato (*Ipomoea batatas* (L.) Lam.)

RECENT work on meiosis[1,2] has given considerable support to the suggestion of King and Bamford[3], based on mitotic investigations, that the sweet potato is an allopolyploid, $2n=90$, resulting from hybridization and natural doubling of the chromosome number in $F1$. The incidence of secondary associations of bivalent chromosomes at metaphase has been interpreted by Ting *et al.*[2] as indicating that the sweet potato, derived from somewhat related species, is a 'relatively recent species'.

While this interpretation may be of general validity in sexually reproducing plants, its unqualified applica-