there are as there may well be cases of temporary explosions of population growth.

EDWIN B. WILSON

SCHOOL OF PUBLIC HEALTH,
HARVARD UNIVERSITY

HAPLOID MALES IN PARACOPIDOSOMOPSIS

SEVERAL years ago one of us (Patterson, 1917)[1] called attention to the fact that in certain species of parasitic Hymenoptera a majority of their polyembryonic broods are mixed, that is, contain both males and females. In a species showing polyembryonic development we should expect to find all the individuals belonging to one sex, provided the entire brood is derived from a single egg. One of the most striking cases of mixed broods is seen in Paracopidosomopsis floridanus (Copidosoma truncatellum). About 87 per cent. of the broods of this species are mixed, and a majority of such broods have less than 6 per cent. of males. In one case a single male was found in a brood of 1,550 individuals.

The rule among polyembryonic species is that the fertilized egg produces females, while the unfertilized egg develops into males. The usual explanation offered to account for the appearance of a mixed brood is that it has come from two (or more) eggs, one of which is unfertilized. In dealing with the data on the sexes of the species under consideration, the senior writer pointed out the difficulty of applying this hypothesis, and suggested that a mixed brood might arise from a fertilized egg during the early cleavage stages, by the loss of a sex chromosome in one or more blastomeres. Such a blastomere would have the diploid-minus-one number of chromosomes and might give rise to a group of males. It was further pointed out that this suggestion could be tested out by making a cytological study of the germ cells of the males appearing in mixed broods. For several years we attempted to secure the necessary material for such a study, but not until last fall (1923) did we succeed in obtaining favorable preparations.

The object of this note is to record the results of our observations. We find that the males from mixed broods possess the haploid number of chromosomes, and not the approximate diploid number. The spermatogenesis in these males is identical with that in males reared from unfertilized eggs (Patterson and Porter, 1917).[2] Our observations leave no doubt as to the fact that males in mixed broods are haploid, and this is true even in broods showing a very low percentage of males.

While the discovery of these facts settles the question of the number of chromosomes in males in mixed broods, it does not, however, definitely determine the manner of origin of mixed broods. To some it might seem to indicate that all mixed broods are to be explained on the two-egg hypothesis, but there are several facts in the development, at least of Paracopidosomopsis, that are difficult to explain on such a basis. Chief among these are (1) the appearance of asexual larvae, and (2) that while a pure male brood reared from an unfertilized egg is about as large as a pure female brood, yet if the unfertilized egg is associated with a fertilized egg in the same host it produces a few males only—sometimes but a single individual.

For the final solution of some of these problems we must look to the study of some of the more primitive polyembryonic species, such as that studied by Leibly and Hill, 1923.[3]

J. T. PATTERSON,
G. W. D. HAMLETT

AUSTIN, TEXAS

AN ANATOMICAL SPELLING MATCH

WHEN the freshman begins his work in the anatomy laboratory he frequently fails to grasp the importance of using all possible channels for gaining the necessary anatomical information, and frequently the story of the test given Vesalius, in Paris, has been described to the students. Richardson, in his book "Disciples of Aesculapius," tells that Vesalius "was closely blindfolded. Then every bone of the body that could be distinguished by the touch was put into his hands and by the sense of touch he was able to name every bone correctly. . . ." Recently, some members of the class asked if they might not try this same test and now two classes have tried this "anatomical spelling match" and so I am passing it on for what it is worth.

The students choose two leaders and they in turn select two groups, thus dividing the class or laboratory section into two teams, as is done in the regular spelling match or in the chemical spelling match, of which so much has been heard lately. The two groups arrange themselves in two rows with their backs towards the opposing sides so that the bones may easily be placed in their hands held behind their backs. This is as satisfactory and takes much less time than blindfolding all the contestants. The one in charge passes down between the two rows and places a bone in the hands of each contestant, one after another, alternately from side to side.

We have found that only one or two men can be

[1] *Biol. Bull.*, XXXII, p. 291.

[2] *Biol. Bull.*, XXXIII, p. 38.

[3] *Jour. Agr. Research*, XXV, p. 337.