

2. Those pupæ which become perfect moths are likewise different from those which cannot emerge as perfect moths.

3. The basis for selective elimination is to be sought in correlation between the various structures.

The mating period follows immediately after metamorphosis, when certain individuals with weak mating instinct fail to take part in the production of the next generation, and are thus "sexually eliminated." In order to determine the points mentioned above, pupæ of the two species named were isolated as the time for metamorphosis approached, and upon emergence were given one opportunity to mate. It was therefore possible to compare the pupæ of the two classes of mating and non-mating individuals. The results, briefly stated, are :

1. That even slightly imperfect moths possess very little mating instinct, or in other words, that, with the structural conditions associated with an imperfect power of emergence, is correlated a low grade of mating ability.

2. That the mating individuals of the perfect class differ structurally to a certain extent from the non-mating ones, but they are very much less variable than the latter class.

The importance of these results from the standpoint of inheritance and evolution is sufficiently clear to render extended discussion unnecessary.

**28. "Observations on a serous fluid of unusually high molecular concentration : " EDWARD K. DUNHAM.**

The fluid was removed from the pleural cavity of a man suffering from lobar pneumonia. The patient was a scene-shifter in a theater, and had suffered considerable pain in the chest for four months before his admission to the hospital. His occupation required severe labor for brief periods, during which he became much heated, with intervals of leisure and exposure to cold drafts of air. The immediate reasons for his admission were a chill and inability to continue work. There was nothing unusual in the clinical course of the pneumonia or peculiar in his treatment. A few days after he entered the hospital 400 c.c. of a clear serous fluid were aspirated from the affected side of the chest. This fluid was examined on the same day, with the following results :

Distinctly alkaline; specific gravity, 1.021; depression of the freezing point,  $1.383^{\circ}$  C. (mean of three examinations with different portions of the fluid,  $1.395^{\circ}$  C.,  $1.385^{\circ}$  C., and  $1.370^{\circ}$  C., respectively); electrical conductivity, 0.009119; chlorin calculated as NaCl, 0.58%; total nitrogen, 0.84%; nitrogen from washed tannic acid precipitate, expressed in percentage of the fluid, 0.83%; proteid ( $N \times 6.25$ ), 5.21% of the fluid; traces of reducing substance (sugar?) after removing proteids with ferric acetate; traces of nitrogen liberated by hypobromite of soda; no extractives of appreciable amount upon shaking with ether, acetic ether, or chloroform.

The matter of chief interest in the results was the considerable depression of the freezing point —  $0.81^{\circ}$  C. greater than that by the blood, which was found to be  $0.57^{\circ}$  C. This  $0.81^{\circ}$  C. represents nearly 0.438 gram-molecule in solution in excess of the molecular concentration of the blood, and appears to be a clear indication that osmotic interchanges between this fluid and the blood did not freely take place, possibly because of a thick layer of fibrin upon the pleural surfaces. Such a deposit would not, however, explain the high molecular concentration of the fluid. It appears most probable that this was produced subsequent to the formation of the fluid, by cleavages in the larger molecules originally present in solution, or by the solution of substances not at first dissolved. These substances could not be dissociable, because the electrical conductivity was rather lower than is usual in such fluids. If the substances causing the high molecular concentration were organic compounds, they were not extractives soluble in ether, acetic ether or chloroform.

On the assumption that cleavage products of proteid substances, precipitable with tannic acid, might be present and cause the unusual depression of the freezing-point, the following experiments were made: Sterile horse serum, which had not been subjected to heat, was divided into portions. Of these some were kept for controls and others were inoculated with pure cultures of *Staphylococcus pyogenes aureus* or Fraenkel's pneumococcus. Freezing-point determinations were made on certain of these portions and the rest were sealed up in pipettes holding 100 c.c. each. These were incubated at  $37^{\circ}$  C. for a week, when freezing-point determin-

ations were made on one of the controls and on one of the tubes inoculated with each kind of bacteria mentioned. Cultures at this time showed the presence of great numbers of the species used, with no admixture of other species. The remaining tubes were left in the incubator for several months, when cultures proved to be sterile. The results of physico-chemical examination of these sera are tabulated below:

HORSE SERUM A.		
<i>Sterile Controls.</i>		<i>Inoculated with Staphylococcus.</i>
	°C	°C
1903		
May 19.....	$\Delta = 0.580$ ; K = 0.009394	$\Delta = 0.585$ ; K = 0.009370
May 26.....	$\Delta = 0.580$ ; K = 0.009491	$\Delta = 0.585$ ; K = 0.009674
1904		
Jan. 16.....	$\Delta = 0.590$ ; K = 0.009684	$\Delta = 0.640$ ; K = 0.010128
HORSE SERUM B.		
<i>Sterile Controls.</i>		<i>Inoculated with Staphylococcus</i>
	°C	°C
1903		
May 21.....	$\Delta = 0.560$ ; K = 0.009516	—————
May 28.....	$\Delta = 0.560$ ; K = 0.009516	$\Delta = 0.580$ ———
1904		
Jan. 15.....	$\Delta = 0.600$ ; K = 0.009897	$\Delta = 0.640$ ; K = 0.010372

These data show but slight changes in the molecular concentration of the sera, and such changes as had occurred occasioned an increase in the electrical conductivity as well as in the depression of the freezing-point, showing that dissociable bodies had been produced. The experiments, therefore, failed to explain the high molecular concentration of the serous fluid from the chest, but it is possible that further investigation in this direction will be more successful.

**29. "An experimental study of the eosinophile cells during infection with an animal parasite — *Trichina spiralis*":**  
**EUGENE L. OPIE.** [Presented by JAMES EWING.]

The administration of *Trichina spiralis* to the guineapig causes an increase of the eosinophile leukocytes in the blood, comparable to that which accompanies human infection. There is no constant alteration of the number of these cells until the end of the second week after infection, when the relative and absolute number rapidly increases and reaches a maximum at the end of the