Semenza, L., and Barigozzi, C. Chromosomes of Aphiochaeta xantina. The ganglial cells, as well as the spermatogonia, show 10 chromosomes, all telomitic with strong somatic pairing. The spermatogenesis shows a very clear pachytene, with 5 pairs. Doplotene with chiasmata. No chromocenters in the resting nuclei. Salivary chromosomes generally do not show bands.

Singleton, J. R. and Zimmering, S. Interchromosomal interference in D. melanogaster. An experiment was designed to determine the extent of interchromosomal interference in the absence of inversions. Females of the constitution b cn c bw were crossed by ru h th ss males, and the F_1 heterozygous females backcrossed by Cy/b cn c bw; ru h th ss/ru h th ss males (since the homozygous b cn c bw; ru h th ss males were found to be sterile.) The non-Cy offspring were classified according to crossover types. A simple Chi-square test based on some 14,000 flies indicated no obvious interchromosomal interference in this experiment. A more detailed analysis on about twice as many flies is under way.

Sobels, F. H., Kruijt, J. P. and Spronk, N. Lethality due to combined action of the genes Dichaete and eyeless-dominant. After crossing D/+ and ci^D/ey^D flies, we found that the F_1 class D; ey^D showed an almost complete lethality of 95%-100%, whereas the ey^D class showed only a relatively slight decrease to 25%. Reciprocal crosses gave slightly different results, as the offspring of D mothers rendered some break-throughs, which have only rarely been observed with ey^D mothers; These facts might point in the direction of a maternal influence. The lethality obviously only occurs in the pupal stages, as by means of marking with ebony, egg and pupal counts, no specific morality of the D; ey^D or ey^D classes could be observed during the larval period. About 75% of the D;ey^D animals die in an early pupal stage. The late lethal pupae are characterized by highly abnormal heads, with more reduplications of the antennae and more extreme reduction of the eyes as compared to the ey^D class. The bristle pattern is always disturbed. Extreme reduction of eye size is often correlated with reduplication of the antennae. Reduplication of the antennae causes a decreased possibility of emergence, probably by affecting the ptilinum mechanism. Sometimes cause of lethality was most evident by complete reduction of the head, the labium excepted. The same abnormalitites, however, to a less extreme degree, were also observed in the few emerging D; ey^D flies.

At 16° eye size is less reduced, antennal reduplications occur less often, and in consequence the amount of lethality is lowered. Temperature treatment during 60 hours at 16°, and beginning at different periods after hatching, influences eye size and antennal reduplications and gives more or less comparable results to those found by M. Vogt (1947) for Def^{r-L} and ant.

Hence we may conclude that expressivity of eyeless-dominant may be strongly influenced by the dominant gene Dichaete; a similar but weaker effect was obtained by combining ey^D with Moire. Secondly, the developmental processes causing this lethality are dependent on temperature. In addition it may be mentioned that this lethality is much higher in males than in females and that the rest of the genotype also influences the phenomena described here.

Spiess, E. B. Recent collections in New England. The northeastern limits of distribution for Drosophila species in North America have been rather sparsely investigated;

in fact, no large-scale collections have been made farther north than southern Vermont and New Hampshire (Spiess, 1949, Jour. N. Y. Ent. Soc.). A recent collection sent from the Mt. Desert Biological Survey, Bar Harbor, Maine, during the summer of 1950 included the following species: affinis (1), algonquin (4), athabasca (5), melanogaster-simulans (173), melanica paramelanica (5) putrida (3), quinaria (2), quinaria group (?) (1), robusta (2), and busckii (4). Except for athabasca and algonquin, all other species here are first evidence of their northern distribution. Bar Harbor is in the Transition Life Zone, but since this collection was made in mid-summer it is not too surprising to find forms like paramelanica and busckii in the population.

In October of the same year we made a collection in Lexington, Massachusetts, with the following results: algonquin (8), athabasca (25), melanogaster-simulans (1 female), immigrans (5), busckii (3), putrida (1), sigmoides (1), transversa (1), Chymomyza amoena (1). The presence of sigmoides in this collection is unusual, since its center of distribution is approximately Tennessee-Carolina and it has never been taken north of New York City. The collecting site was in birch and oak woods about a quarter of a mile from a settled area. All the other species have been taken at that time of year in the Boston area.

Spiess, E. B., Ketchel, M. and Terrile, B. A. Physiological properties of gene-arrangement carriers in D. persimilis. Flies from Jacksonville, California, (elev. 800) containing the Whitney and Klamath arrangements of the third chromosome have been tested for egg-laying capacity, longevity, wing-beat frequency, and wing-area dimensions. Various culture conditions and mating procedures were utilized in the latter two cases; but the basic experimental procedure throughout was the mixing of strains at random in a population cage in order to get genetic heterozygosity with gene-arrangement homozygosity. All cultures were kept at 15° C. Heterozygotes for gene arrangements were F_1's of population-cage progeny. Results were as follows: (1) Egg-laying capacity: WT/WT maintains about 13-15 eggs per day for about 100 days; KL/KL starts at 13.5 for ten days, but falls off to 8-9 eggs per day for the next 100 days; WT/KL maintains a high rate of production (17-20) for the first sixty days, thereafter falling off faster than homozygotes. In senescence (100-170 days from pupa) all three types give equal rates, a fact which might be expected since natural selection would have built up genetic combinations for high production in early life. (2) Both homozygotes survive equally well under these experimental conditions, but heterozygotes have a significantly lower mortality rate. All three have long-lived individuals which survive until about 170 days. (3) Wing-beat frequency (using a stroboscopic method perfected by Williams and Chadwick): WT/WT. 11,020 beats per minute; KL/ KL, 9170 beats per minute, WT/KL (from WT mothers), 11,410; WT/KL (from KL mothers), 11,090. All standard errors are less that 100 beats per minute. (4) Wing-area dimensions for these types are WT/WT, 2.60 mm^2; KL/KL, 3.16 mm^2; WT/KL (WT mothers), 3.07 mm^2; and WT/KL (KL mothers), 2.76 mm^2. Standard errors are less than 0.04 mm^2. A "stroke-energy" index proportional to the kinetic energy given to the air by the wing beat (Reed, Williams, and Chadwick, Genetics, 1942) can be applied to determine which type is expending the greatest amount of energy. This index is as follows for these zygotic types: WT/WT, 762; KL/KL, 830; WT/KL (WT mother), 1236; WT/KL (KL mother), 907. By varying the culture conditions and mating procedures in different ways, wing dimensions and wing-beat frequencies may be caused to vary rather considerably; but in all cases so far heterozygotes have had a higher "stroke-energy" than either homozygous type, although in some cases not significantly higher. These are being retested at present.