ranged, but differ from those of notch *melanogaster* in being entirely wanting on each side in a narrow band just inside the dorso-central row.

The unusual features of notch in *melanogaster* are not limited to its morphological nature. Notch is one of the few dominant mutant genes, and in addition is sex-linked and has a recessive lethal effect. The result is that a notch female gives equal numbers of wild-type and notch daughters and of wild-type sons. Notch males never appear. This is the only known dominant sex-linked gene that is also lethal—except *funebris* notch. We have seen that the original notch culture, 5201, gave the characteristics 1: 1: 1: 0 ratio; and this has been repeated by the notch females produced in that culture, both when mated to their brothers and when mated to unrelated wild-type males.[4]

The striking parallel between these two mutants makes it highly probable that they represent the same genetic change. This view is strengthened by the fact that notch is one of the most frequent mutations in *melanogaster* (known to have occurred seven times), and might therefore be expected to be one likely to occur in another species.

Summary.—Notch *melanogaster* and notch *funebris* agree in the following respects:

1. Wings usually irregularly nicked at tip.
2. Certain veins thickened.
3. Eyes often small and roughened.
4. Acrostichal hairs not in definite rows.
5. Anterior scutellar bristles often doubled.
6. Character is dominant.
7. Gene has a recessive lethal effect.
8. Gene is sex-linked in *melanogaster*, almost certainly so in *funebris*.
9. Mutation is one of the most frequent in *melanogaster*, and the first certain one in *funebris*.

A. H. STURTEVANT

COLUMBIA UNIVERSITY,
May, 1918

[4] It is theoretically possible that *funebris* notch is not sex-linked, but that the gene is dominant in females, lethal in males. This can be determined by finding gynandromorphs, or by finding other sex-linked genes and observing their linkage to notch.

THE KENTUCKY ACADEMY OF SCIENCE

THE Kentucky Academy of Science held its fifth annual meeting at the University of Kentucky on Saturday, May 4, 1918, with Mr. J. E. Barton, vice-president, in the chair. After a brief business session, at which several new members were elected, the following program was presented:

President's address, by J. E. Barton, acting president, "The regenerative forests of eastern Kentucky and their relation to the coal-mining industry." The extensive coal-measures of eastern Kentucky support a valuable forest growth, which is of great usefulness in the mining of coal. At the present time it takes about three acres of timber to mine one acre of coal. The ratio should be nearly one acre of timber to one acre of coal. This condition can be brought about by careful management, which is justified by the fact that the coal supply will last about one hundred years, at present rate of production. Timber can be raised in a thirty-year rotation, of sufficient size and character for mining purposes, by a proper selection of species, an area fully stocked and adequate *protection* against fire and live stock.

Differences in the ossification of the male and female skeleton: DR. J. W. PRYOR.

Scientific education: J. J. TIGERT. The rapid development of scientific agriculture. Education followed agriculture in scientific progress. Scientific procedure dependent upon quantitative measurement. Statistical methods and measurements in education. Standard tests. The measurement of intelligence. Charts and tables showing results of measurements in the Cynthiana schools in 1916–17 and the Lexington schools in 1917–18. Age-grade table, Cynthiana, shows 22 per cent. of pupils retarded. Comparison of promotions in Cynthiana and other American cities shows a larger percentage of promotion in Cynthiana than elsewhere. Ayres Spelling Test in Lexington and Cynthiana shows Lexington three points above the average of 84 American cities, and Cynthiana equal to the average of 84 American cities. Handwriting tests in Lexington and Cynthiana show both these cities below the average city in speed and quality of handwriting. Arithmetic tests in Cynthiana show Cynthiana below standard measured by the Woody Scale. A comparison of boys and girls in spelling and handwriting shows the girls to be superior to the boys.

The effect of manganese on the growth of wheat: J. S. MCHARGUE. After reviewing briefly some noteworthy results obtained by previous investi-

gators on the relation of manganese to agriculture, the author presented results obtained by growing wheat in manganese-free sand and in cultural solutions, with and without the addition of manganese.

Wheat plants grown to within a few weeks of maturity in cultural solutions containing manganese and others of the same age in which the manganese had been omitted, were on exhibition. Where manganese had been added to the cultural solutions the plants were apparently normal in every respect, whereas the plants grown in solutions containing no manganese showed a retarded growth in the blades, stalks and roots, as compared with the plants of the same age receiving manganese. There was evidence of lack of the proper development of chlorophyl in the plants receiving no manganese and the blades of these plants exhibited a drooping appearance in that they were not able to hold themselves erect, which was quite characteristic and not to be observed in any of the plants receiving manganese.

The author concludes from his experiments that manganese plays a more important rôle in the growth of wheat than has hitherto been suspected.

Formation of petroleum: C. J. Norwood. (By title.)

Cryoscopic work with an ordinary thermometer: C. C. Kiplinger. It has been found possible to read small temperature intervals on a common thermometer, within an accuracy of 1/100 degree, by measurements of the parallax on an auxiliary scale equipped with a sliding peep-sight.

Several heretofore troublesome sources of error in the boiling point method of determining molecular weights have been eliminated by using but one point as reference on a thermometer scale, having established this point by the use of a known substance with a high degree of purity. This procedure eliminates the need of a calibrated thermometer.

The use of the parallax method is suggested in the estimation of fractional parts of a scale division on other instruments than the thermometer.

Generalization on the mean-value theorem: H. H. Downing.

Magnolia fraseri: does it occur in Kentucky? Frank T. McFarland.

List of fungi from Kentucky: Frank T. McFarland.

An equation balance: E. L. Rees.

A method of constructing the graph of an equation in which the variables may be separated: E. L. Rees.

Protein metabolism in the growing chick: G. D. Buckner and others. (By title.)

Review and observations on the mosaic disease of tobacco: G. C. Routt. The author reviews the work of other investigators and reports observations of his own upon the disease in experimental plots of different varieties of tobacco. He favors the view that the best way to combat the disease will be to develop a resistant strain of tobacco.

Dr. J. A. Detlefsen, of the department of genetics of the University of Illinois, addressed the academy on "Laws governing the transmission of characters from parent to offspring."

The speaker gave a brief review of the search by investigators for the cause or causes of evolution. He then explained the law for the transmission of mono-hybrids, di-hybrids and tri-hybrids. He presented these laws and illustrated them so well that there was left no doubt in the minds of workers in other fields that great progress has been made in genetics in recent years.

He threw upon the screen the tables giving the result of his own breeding experiments to show how nearly actual counts agree with the mathematical expectation, in the laws of transmission. It is remarkable how nearly actual counts of animals bred agree with the expectation of what, by Mendel's law, they should be.

Among other items of business, a resolution was passed offering the services of the academy to the U. S. government for any war work in which this organization might be of assistance.

Officers were elected as follows:

J. E. Barton, Frankfort, President; P. P. Boyd, Lexington, Vice-president; A. M. Peter, Lexington, Secretary; J. S. McHargue, Lexington, Treasurer.

Alfred M. Peter,
Secretary

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