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A Study of the Inheritance and the Physiological Behaviour of Dwarfism Associated with an Eye Defect in Rats

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covery of E. M. F. In most cases an overshooting effect was observed. This might be expected as a result of the oxygen debt incurred.

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A STUDY OF THE INHERITANCE AND THE PHYSIOLOGICAL BEHAVIOUR OF DWARFISM ASSOCIATED WITH AN EYE DEFECT IN RATS

A. SCIUCHETTI AND W. V. LAMBERT

Four dwarfed rats recently appeared in two separate closely related litters of an inbred strain of rats in our colony. There was associated with the dwarfed condition a marked opacity of the eyes apparently causing blindness.

A study of the genetic and physiologic behaviour of these defective characters has been started. While not complete, certain conclusions may be drawn. These two defects are recessive and seem to be absolutely correlated. The results obtained indicate that only one gene is involved. The defects are not sex linked nor sex-limited. In order to determine the age at which the size difference became manifest, weights of each animal were taken at intervals of four days beginning with the fifth day after birth. An analysis of variance of the weights from two defective litters at three age intervals has been made. The analysis of variance of the weights at the first and second age interval shows no significant differences in weight among the individuals of the litters. The results at the third age interval, on the contrary, show highly significant variation between the defective and the normal groups of rats within a litter. The reduced size, therefore, begins to manifest itself significantly at an age of 12 to 13 days. As soon as the eyes are opened the defect is clearly seen. At the 10th to 12th day the hair of the defective rats appears much softer and it is thinner than the hair on normal rats. At a later age the ears are larger than those of their normal litter mates.

The defective animals are in general much weaker than their litter mates. Their appearance is quite infantile and they are much less active. At 150 days dwarf individuals are about three-fifths the weight of their normal mates. Both male and female so far have proven entirely sterile.

Possibly a hypophyseal deficiency causes the dwarfiness. Experiments are under way to check this hypothesis.

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A NEW CHARACTER IN THE GUINEA PIG — "SILVERING"

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Silvering is a recessive character that manifests itself by the appearance of many white hairs in the fur, chiefly on the back and sides. At birth the character is not apparent, gray hairs first appearing on the posterior region of the back when an animal is about four months old. The number of gray hairs increases after this age for the next three or four months. In high grade silvers there is a progressive increase in the amount of graying until the animal is about a year old.

Much variation occurs in the degree of silvering, this varying from a trace to high grade silvers. For convenience of classification silver animals were placed in five groups, from group 1, including animals of the highest grade, to group 5; animals of group 5 show only a trace of silvering. Matings of silvers with silvers, all animals of grade 4 or above, produced 43 offspring, 37 with silvering of grade 4 or above, 4 animals of grade 5 and 2 showing no silvering. The six animals showing no silvering, or only a trace, were produced by three females of grade 4, namely with a low degree of silvering. Matings of heterozygotes with silvers of grades 1 and 4 produced 26 non-silvers, 11 with a trace of silvering and 27 silvered of grade 4 or above. Matings of heterozygotes together produced 12 non-silvered, 4 animals showing a trace of silvering and 6 silvered. These results indicate that an autosomal monogenic difference exists between silvered and non-silvered animals, although it appears that modifying factors affect the degree of silvering. The character is expressed to an equal degree in males and females.

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