

identification. A few of the sediments contained high percentages of broad "renal failure" casts described by Addis¹. Plots from these sediments show high mean diameters and high degrees of dispersion, but are not otherwise significantly different from the other curves. In general the dispersion increases with increasing mean diameter. The broadest casts seen measured 98 microns.

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Hereditary doubling suggesting anomalous chromatin distribution
in the mouse.

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Mice with six legs appeared about two years ago in a stock which had descended from five individuals and had been inbred for several generations. Since this stock had been subjected to no special treatment, the possibility of the anomaly having a purely hereditary basis suggested itself, and in the fall experiments were undertaken to determine if such were the case.

In the course of the tests many anomalous individuals have been produced ranging from Y-shaped specimens with four hind legs and two tails, to those with a relatively slight degree of doubling in the external genitalia. These may all be referred to as "doubles." Apparently connected with the same manifestation is the appearance of hemorrhagic testes, *spina bifida*, and occasional other anomalies such as microphthalmia. The anomalous individuals are for the most part incapacitated for breeding, so their parents and sibs have been isolated from the rest of the stock and used for the experiments.

At first anomalous individuals were produced about equally by the selected (D) and unrelated (B) strains, but gradually the former began to show an increased incidence which has risen to about 12 per cent (113:805) for the whole A strain and about

¹ Addis, Renal Failure Casts, *J. Am. Med. Assn.*, 1925, lxxxiv, 1013.

20 per cent (45:178) for the best producers. In the meantime doubling has been practically eliminated from the B strain, only two anomalous individuals having appeared among the last 1100 or more young. In a few instances the character of the anomaly has been such as to permit of the production of young, and one mating between two anomalous individuals has been successful. Results of different types of matings are as follows:

Mating	Normal Young	Double Young	
1. Double x Double.....	13	1	8 %
2. Double x Normal (D strain).....	127	10	8 %
3. Normal (D) x Normal (D).....	805	113	20%
4. Normal (D) x Normal (B).....	348	7	2 %
5. Normal (B) x Normal (B) (more than).....	1100	2	2 %

In view of the fact that the animals are all closely related, have been kept in the same room, and received similar treatment, there can be little doubt that the anomaly has a germinal basis which, through selection, has been mostly segregated in the D strain and practically eliminated from the B strain. But the results of the breeding tests do not accord with expectations based on the assumption that the anomaly is conditioned by either one or two dominant, recessive, or cumulative genes. On any theory "non-appearance"¹ must be taken into account as an important element in the situation. A single dominant gene with a somatic "non-appearance" of about 70 per cent would account for all the classes but would not give proportions very close to those observed—20 per cent, 18 per cent, and 15 per cent, instead of 8 per cent, 8 per cent, and 11 per cent in groups 1, 2 and 3. Differential prenatal death rate is also to be considered but is not of itself adequate to explain relative difference between classes. A differential factor favoring the production and function of normal gametes in heterozygous individuals would affect different classes differently and bring the expected numbers closer to those actually observed.

This leads to the tentative hypothesis that we are dealing in this case with some form of chromosomal aberration involving a certain amount of reduplication in chromatin material (a whole chromosome, or part of one) without necessarily any qualitative change in the chromatin material itself. The character of the

¹ *Genetics*, 1924, ix, 206.

trait itself, which is not a very specific entity but involves essentially increases or aberrations in structures which are normally present, might be regarded as rather favoring this explanation. Before this hypothesis, which would bring these cases of mammalian teratology into line with many roughly similar phenomena in the field of botany, can be regarded as more than a suggestion, a great deal of critical data must be accumulated. If it should be substantiated one of the main causes of the observed aberrant ratios would be the frequent failure of cells which receive the extra chromatin element to develop into functioning gametes.

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Microelectrodes and micromagnets.¹

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Two kinds of microelectrodes and one micromagnet have been perfected and used with very good results.² First, it was found that a platinum wire (No. 35, C.P.) inserted into a close-fitting quartz capillary can be drawn over a minute oxy-acetylene flame to a perfectly insulated needle-point less than one micron in diameter. Indeed, the platinum core in this exceedingly fine point may closely approximate the limits of microscopic vision.

The platinum wire at the opposite (undrawn) end extends a few mm. beyond the quartz capillary in order that the former may be annealed to an insulated copper wire of about the same diameter as that of the platinum wire and 2 feet in length. The drawing of the electrodes (see Fig. A, 1 and 2) and the annealing is readily done over the oxy-acetylene microburner (m.b.). About 3 mm. of the needle-tip of the electrode is bent over the flame, at right angles (Fig. A, 3) and the opposite end is sealed with deKhotinsky cement into a glass shank 5 mm. in

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² Taylor, Cataphoresis of Ultramicroscopic Particles in Protoplasm, *PROC. SOC. EXP. BIOL. AND MED.*, 1925, xxii, 533.